

LABORATORY DATA CONSULTANTS, INC.

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Posillico Consulting
1750 New Highway
Farmingdale, NY 11735
ATTN: Mr. Ellis Koch

April 25, 2014

SUBJECT: Glen Isle, Data Validation

Dear Mr. Koch,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on April 8, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #31626:

SDG #

160-5519-1, 160-5606-1
160-5651-1, 160-5691-1
160-5692-1, 160-5697-1
160-5703-1, 160-5766-1
160-5766-2

Fraction

Gamma Spectroscopy, Alpha Spectroscopy, Radium-226, Radium-228

The data validation was performed under category A and B guidelines. The analyses were validated using the following documents, as applicable to each method:

- Multi Agency Radiological Laboratory Analytical Protocols Manual, July 2004
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, EPA 540-R-10-011, January 2010

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink
Project Manager/Chemist

LDC #31626 (Posillico Consulting - Farmingdale, NY / Glen Isle)

31626ST.wpd

Site: Glen Isle
Laboratory: Test America St. Louis, MO
Report No.: 160-5519-1
Reviewer: Christina Rink and Mark Gregg/Laboratory Data Consultants for RXR
Glen Isle Partners, LLC
Date: April 21, 2014

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
FB018	160-5519-1	Gamma Spectroscopy, Alpha Spectroscopy, Ra-226, Ra-228
LT-C-045-4-6**	160-5519-2	Gamma Spectroscopy**, Alpha Spectroscopy**
FB018DUP	160-5519-1DUP	Gamma Spectroscopy, Alpha Spectroscopy
LT-C-045-4-6DUP	160-5519-2DUP	Gamma Spectroscopy, Alpha Spectroscopy

Associated QC Samples(s):

Field Blanks: FB018

Field Duplicate pair: None Associated

The above-listed water and soil samples were collected on February 6, 2014 and were analyzed for gamma spectroscopy by method GA-01-R, alpha spectroscopy for isotopic thorium and isotopic uranium by method A-01-R, Radium-226 by EPA Method 903.0, and Radium-228 by EPA Method 904.0. The data validation was performed in accordance with the *Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual* (July 2004) and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, EPA 540-R-10-011* (January 2010), modified as necessary to accommodate the non-CLP methodologies used.

The radiometric data were evaluated based on the following parameters:

- Overall Evaluation of Data and Potential Usability Issues
- Data Completeness
- Holding Times
- Instrument Calibration
- Blank Analysis Results
- Chemical Recovery
- Laboratory Duplicate Results
- Field Duplicate Results
- Laboratory Control Sample (LCS) Results
- Detection Limits Results
- Sample Quantitation Results

Overall Evaluation of Data and Potential Usability Issues

All results are usable as reported or usable with minor qualification due to sample matrix.

Samples indicated by a double asterisk on the front cover underwent Category B review. A Category A review was performed on all of the other samples. Calibration and raw data were not evaluated for the samples reviewed by Category A criteria since this review is based on QC data.

The validation findings were based on the following information.

Data Completeness

The data package was complete as defined under the requirements for the NYSDEC ASP category B laboratory deliverables.

Holding Times

All holding times were met.

Instrument Calibration

All criteria were met for samples on which a Category B review was performed. Calibration data were not evaluated for the samples reviewed by Category A criteria.

Blank Results

Gamma Spectroscopy

Isotopes were detected above the minimum detectable activity (MDA). The presence of activity indicates that false positives may exist for these isotopes in the associated samples. Action Levels (ALs) were established at < RL. The following table summarizes the activities detected.

Blank ID	Isotope	Level Detected	Action Level	Associated Samples
PB (prep blank)	Actinium-228	0.02469 pCi/g	<RL	LT-C-045-4-6**
	Radium-228	0.02469 pCi/g	<RL	

Sample results were qualified as follows:

- If sample concentration was < the reporting limit (RL) and \leq the Action Level, qualify the result as a nondetect (U) at the RL.
- If sample concentration was > the RL and \leq the Action Level, qualify the result as not detected (U) at the reported concentration.
- If the sample concentration was > the RL and > the Action Level, qualification of the data was not required.

No samples were qualified since the associated sample results were greater than the RL.

FB018 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Alpha Spectroscopy

Isotopes were detected above the minimum detectable activity (MDA). The presence of activity indicates that false positives may exist for these isotopes in the associated samples. Action Levels (ALs) were established at < RL. The following table summarizes the activities detected.

Blank ID	Isotope	Level Detected	Action Level	Associated Samples
PB (prep blank)	Thorium-228	0.09496 pCi/L	<RL	FB018

Sample results were qualified as follows:

- If sample concentration was < the reporting limit (RL) and \leq the Action Level, qualify the result as a nondetect (U) at the RL.
- If sample concentration was > the RL and \leq the Action Level, qualify the result as not detected (U) at the reported concentration.
- If the sample concentration was > the RL and > the Action Level, qualification of the data was not required.

No samples were qualified since the associated sample result as nondetect.

FB018 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Radium-226

Isotopes were detected above the minimum detectable activity (MDA). The presence of activity indicates that false positives may exist for these isotopes in the associated samples. Action Levels (ALs) were established at < RL. The following table summarizes the activities detected.

Blank ID	Isotope	Level Detected	Action Level	Associated Samples
PB (prep blank)	Radium-226	0.2304 pCi/L	<RL	FB018

Sample results were qualified as follows:

- If sample concentration was < the reporting limit (RL) and \leq the Action Level, qualify the result as a nondetect (U) at the RL.
- If sample concentration was > the RL and \leq the Action Level, qualify the result as not detected (U) at the reported concentration.
- If the sample concentration was > the RL and > the Action Level, qualification of the data was not required.

No samples were qualified since the associated sample result was nondetect.

FB018 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Radium-228

No isotopes were detected above the minimum detectable activity (MDA).

FB018 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Chemical Recovery

All criteria were met.

Laboratory Duplicate Results

The laboratory performed duplicate analysis on sample FB018 and LR-C-045-4-6** for gamma spectroscopy and alpha spectroscopy. The following table lists the isotope results outside of control limits and the resulting actions.

Alpha Spectroscopy

Isotope	RER (Limits)	Affected Sample	Validation Action
Uranium-235/236	1.02 (≤ 1.0)	LR-C-045-4-6**	UJ nondetects

The bias cannot be determined based off this nonconformance. The results can be used for project objectives as nondetects with estimated quantitation limits (UJ) which may have a minor impact on the data usability.

Gamma Spectroscopy

All criteria were met.

Field Duplicate Results

A field duplicate pair was not associated with this sample set. Validation action was not required on this basis.

LCS Results

All criteria were met.

Detection Limits Results

All minimum detectable activities met required detection limits.

Sample Quantitation Results

Calculations were spot-checked; no discrepancies were noted.

DATA VALIDATION QUALIFIERS

- U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.
- J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified “J” data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The ‘J’ data may be biased high or low or the direction of the bias may be indeterminable.
- UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified “UJ” data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The ‘UJ’ data may be biased low.
- R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

LDC #: 31626A35
SDG #: 160-5519-1
Laboratory : Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET Cat A/Cat B

Date: 4-17-14
Page: 1 of 1
Reviewer: MG
2nd Reviewer: [Signature]

METHOD: Gamma Spectroscopy (Method GA-01-R)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 7-6-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	SW	
V.	Matrix Spike/(Matrix Spike) Duplicates	A	DUP
VI.	Laboratory control samples	A	LCS
VII.	Minimum detectable activity (MDA)	A	
VIII.	Sample result verification	A	Not reviewed for Cat A review.
IX.	Overall assessment of data	A	
X.	Field duplicates	N	
XI.	Field blanks	ND	FB = 1

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

1	FB018	W	11		21		31	
2	LT-C-045-4-6 **	S	12		22		32	
3	FB018DUP	W	13		23		33	
4	LT-C-045-4-6DUP	S	14		24		34	
5			15		25		35	
6			16		26		36	
7			17		27		37	
8			18		28		38	
9			19		29	1 PBW	39	
10			20		30	2 PBS	40	

Notes: _____

LDC #: 31626A35
SDG #: —

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: MG
2nd Reviewer: OL

Method: Radiochemistry (EPA Method GA-01-R)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. Calibration				
Were all instruments and detectors calibration as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were NIST traceable standards used for all calibrations?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was the check source identified by activity and radionuclide?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
III. Blanks				
Were blank analyses performed as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. <u>Soil/ Water</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Was a duplicate sample analyzed at the required frequency of 5% in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all duplicate sample duplicate error ratios (DER) ≤ 1.42 ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were tracer/carrier recoveries within the QC limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the Minimum Detectable Activities (MDA) $< RL$?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

LDC #: 31626A35
SDG #: —

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: MG
2nd Reviewer: OL

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
X. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field duplicates.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
XI. Field blanks				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field blanks.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

LDC #: 31626A35**VALIDATION FINDINGS WORKSHEET**
BlanksPage: 1 of 1
Reviewer: MG
2nd Reviewer: CL**METHOD:** Radiochemistry, Method GA-01-R

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were blank analyses performed as required? If no, please see qualifications below.Y N N/A Were any activities in the blanks greater than the minimum detectable activity? If yes, please see qualifications below.**Conc. units:** pCi/g**Associated Samples:** 2 (^{PL}>5x)

Isotope	Blank ID	Blank Action Limit	Sample Identification										
			No Qual's.										
	PB												
Ac-228	0.02469	0.123											
Ra-228	0.02469	0.123											

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:

All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 31626A35
SDG #: —

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: MG
2nd Reviewer: 02

METHOD: Radiochemistry (Method: GA-01-R)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recalculated using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$
 Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$
 Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R or RPD	%R or RPD	
LCS	Laboratory control sample	Cs-137	34.82 (pci/g)	35.8 (pci/g)	97	97	Y
—	Matrix spike sample	—	—	—	—	—	—
4	Duplicate RPD	Pb-214	0.471 (pci/g) ± 0.0525	0.4388 (pci/g) ± 0.0482	RER 0.32	RER 0.32	Y
—	Chemical recovery	—	—	—	—	—	—

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31626A36
 SDG #: 160-5519-1
 Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET Cat A/Cat B

Date: 4-17-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer: CR

METHOD: Alpha Spectroscopy (Method A-01-R)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-6-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	SW	
V.	Matrix Spike/(Matrix Spike) Duplicates	SW	DUP
VI.	Laboratory control samples	A	LCS/LCSD
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	A	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks (RL) ND SW FB=1		

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

1	FB018	W	11		21		31	
2	LT-C-045-4-6 **	S	12		22		32	
3	FB018DUP	W	13		23		33	
4	LT-C-045-4-6DUP	S	14		24		34	
5			15		25		35	
6			16		26		36	
7			17		27		37	
8			18		28		38	
9			19		29	PBW	39	
10			20		30	PBS	40	

Notes:

LDC #: 31626A36
SDG #:

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: MG
2nd Reviewer:

Method: Radiochemistry (EPA Method A-01-R)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. Calibration				
Were all instruments and detectors calibration as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were NIST traceable standards used for all calibrations?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was the check source identified by activity and radionuclide?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
III. Blanks				
Were blank analyses performed as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. <u>(Soil) / (Water)</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Was a duplicate sample analyzed at the required frequency of 5% in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all duplicate sample duplicate error ratios (DER) ≤ 1.42 ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were tracer/carrier recoveries within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the Minimum Detectable Activities (MDA) $< RL$?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

LDC #: 31626A36
SDG #: —

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: MG
2nd Reviewer: AL

Validation Area	Yes	No	NA	Findings/Comments
D. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XI. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.	✓	✓		< RL

VALIDATION FINDINGS WORKSHEET
BlanksPage: 1 of 1
Reviewer: MG
2nd Reviewer: CZMETHOD: Radiochemistry, Method A-01-R

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were blank analyses performed as required? If no, please see qualifications below.Y N N/A Were any activities in the blanks greater than the minimum detectable activity? If yes, please see qualifications below.Conc. units: pCi/LAssociated Samples: 1 (ND)

Isotope	Blank ID	Blank Action Limit	Sample Identification										
			No Qual.										
	PB												
Th-228	0.09496	0.475											

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:

All contaminants within five times the method blank concentration were qualified as not detected, "U".

SDG #: 1

VALIDATION FINDINGS WORKSHEET

Duplicate Analysis

Page: 1 of 1

Reviewer: MG

2nd Reviewer: 9

METHOD: Radiochemistry (Method: A-01-R)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A

Was a duplicate sample analyzed the required frequency of 5% in this SDG?

Y N N/A

Were all duplicate sample duplicate error ratio (DER) ≤ 1.42 ? $DER = \frac{|\text{Act}_1 - \text{Act}_2|}{2 \sqrt{\delta_1^2 + \delta_2^2}}^{1/2}$ Act = sample activity δ = 1 sigma error

LEVEL IV ONLY:

YN N/A

Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

[illegible]

Comments:

LDC #: 31626A36

SDG #: —

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page: 1 of 1

Reviewer: MG

2nd Reviewer: G

METHOD: Radiochemistry (Method: A-01-R)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recalculated using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$

Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R or RPD	%R or RPD	
LCS	Laboratory control sample	Tn-230	25.09 (pci/g)	24.5 (pci/g)	102	102	Y
—	Matrix spike sample	—	—	—	—	—	—
4	Duplicate RPD	Tn-228	0.393 (pci/g) ± 0.148	0.3343 (pci/g) ± 0.134	RER 0.21	RER 0.21	Y
2	Chemical recovery	U-232	9.975 (dpm)	16.45 (dpm)	60.6	62.1	↓

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31626A29a

VALIDATION COMPLETENESS WORKSHEET

SDG #: 160-5519-1

Laboratory: Test America, Inc.

Cat A Cat B

Date: 4-17-14

Page: 1 of 1

Reviewer: MG

2nd Reviewer: OL

METHOD: Radium 226 (EPA Method 903.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-6-14
II.	Initial calibration	N	Not reviewed for Cat A review.
III.	Calibration verification	N	Not reviewed for Cat A review.
IV.	Blanks	SW	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	not required
VI.	Laboratory control samples	A	LCS/LCSD
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	N	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks	ND	FB = 1

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

water

1	FB018	11		21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBW	40	

Notes: _____

VALIDATION FINDINGS WORKSHEET
BlanksPage: 1 of 1
Reviewer: MG
2nd Reviewer: 9**METHOD:** Radiochemistry, Method 903.0

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

☒ **N** **N/A** Were blank analyses performed as required? If no, please see qualifications below.☒ **N** **N/A** Were any activities in the blanks greater than the minimum detectable activity? If yes, please see qualifications below.**Conc. units:** pCi/L**Associated Samples:** all (ND)

Isotope	Blank ID	Blank Action Limit	Sample Identification									
	PB											
Ra-226	0.2304	<u>1.152</u>										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:

All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 31626A29b
 SDG #: 160-5519-1
 Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET Cat A/Cat B

Date: 4-17-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer: [signature]

METHOD: Radium 228 (EPA Method 904.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-6-14
II.	Initial calibration	N	Not reviewed for Cat A review.
III.	Calibration verification	N	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	not required
VI.	Laboratory control samples	A	LCS/LCSD
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	N	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks	ND	FB = 1

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

1	FB018	11		21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20	PBW	30		40	

Notes: _____

Site: Glen Isle
Laboratory: Test America St. Louis, MO
Report No.: 160-5606-1
Reviewer: Christina Rink and Mark Gregg/Laboratory Data Consultants for RXR
Glen Isle Partners, LLC
Date: April 21, 2014

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
CC-C-013-4-6	160-5606-1	Gamma Spectroscopy, Alpha Spectroscopy
FB023	160-5606-2	Gamma Spectroscopy, Alpha Spectroscopy, Ra-226, Ra-228
CC-C-33-4-6	160-5606-3	Gamma Spectroscopy, Alpha Spectroscopy
CC-C-36-4-6	160-5606-4	Gamma Spectroscopy, Alpha Spectroscopy
LT-R-003**	160-5606-5	Gamma Spectroscopy**, Alpha Spectroscopy**
CC-C-013-4-6DUP	160-5606-1DUP	Gamma Spectroscopy, Alpha Spectroscopy
FB023DUP	160-5606-2DUP	Gamma Spectroscopy, Ra-226

Associated QC Samples(s):

Field Blanks: FB023

Field Duplicate pair: None Associated

The above-listed water and soil samples were collected from February 12, 2014 through February 14, 2014 and were analyzed for gamma spectroscopy by method GA-01-R, alpha spectroscopy for isotopic thorium and isotopic uranium by method A-01-R, Radium-226 by EPA Method 903.0, and Radium-228 by EPA Method 904.0. The data validation was performed in accordance with the *Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual* (July 2004) and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, EPA 540-R-10-011* (January 2010), modified as necessary to accommodate the non-CLP methodologies used.

The radiometric data were evaluated based on the following parameters:

- Overall Evaluation of Data and Potential Usability Issues
- Data Completeness
- Holding Times
- Instrument Calibration
- Blank Analysis Results
- Chemical Recovery
- Laboratory Duplicate Results
- Field Duplicate Results
- Laboratory Control Sample (LCS) Results
- Detection Limits Results
- Sample Quantitation Results

Overall Evaluation of Data and Potential Usability Issues

All results are usable as reported or usable with minor qualification due to laboratory quality control outliers.

Samples indicated by a double asterisk on the front cover underwent Category B review. A Category A review was performed on all of the other samples. Calibration and raw data were not evaluated for the samples reviewed by Category A criteria since this review is based on QC data.

The validation findings were based on the following information.

Data Completeness

The data package was complete as defined under the requirements for the NYSDEC ASP category B laboratory deliverables.

Holding Times

All holding times were met.

Instrument Calibration

All criteria were met for samples on which a Category B review was performed. Calibration data were not evaluated for the samples reviewed by Category A criteria.

Blank Results

Gamma Spectroscopy

Isotopes were detected above the minimum detectable activity (MDA). The presence of activity indicates that false positives may exist for these isotopes in the associated samples. Action Levels (ALs) were established at < RL. The following table summarizes the activities detected.

Blank ID	Isotope	Level Detected	Action Level	Associated Samples
PB (prep blank)	Lead-214	13.62 pCi/L	<RL	FB023
PB (prep blank)	Actinium-228	0.01787 pCi/g	<RL	CC-C-013-4-6
	Radium-228	0.01787 pCi/g	<RL	CC-C-33-4-6
				CC-C-36-4-6
				LT-R-003**

Sample results were qualified as follows:

- If sample concentration was < the reporting limit (RL) and \leq the Action Level, qualify the result as a nondetect (U) at the RL.
- If sample concentration was > the RL and \leq the Action Level, qualify the result as not detected (U) at the reported concentration.
- If the sample concentration was > the RL and > the Action Level, qualification of the data was not required.

Qualified sample results are listed in the table below.

Sample	Analyte	Reported Level	Validation Action
CC-C-013-4-6	Radium-228	0.587 pCi/g	1.00U pCi/g
CC-C-33-4-6	Radium-228	0.781 pCi/g	1.00U pCi/g
CC-C-36-4-6	Radium-228	0.535 pCi/g	1.00U pCi/g
LT-R-003**	Radium-228	0.531 pCi/g	1.00U pCi/g

These results can be used for project objectives as nondetect (U) which may have a minor impact on the data usability.

FB023 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Alpha Spectroscopy

Isotopes were detected above the minimum detectable activity (MDA). The presence of activity indicates that false positives may exist for these isotopes in the associated samples. Action Levels (ALs) were established at < RL. The following table summarizes the activities detected.

Blank ID	Isotope	Level Detected	Action Level	Associated Samples
PB (prep blank)	Thorium-230	0.1046 pCi/g	<RL	CC-C-013-4-6 CC-C-33-4-6 CC-C-36-4-6 LT-R-003**

Sample results were qualified as follows:

- If sample concentration was < the reporting limit (RL) and \leq the Action Level, qualify the result as a nondetect (U) at the RL.
- If sample concentration was > the RL and \leq the Action Level, qualify the result as not detected (U) at the reported concentration.
- If the sample concentration was > the RL and > the Action Level, qualification of the data was not required.

Qualified sample results are listed in the table below.

Sample	Analyte	Reported Level	Validation Action
CC-C-013-4-6	Thorium-230	0.463 pCi/g	1.00U pCi/g
CC-C-36-4-6	Thorium-230	0.542 pCi/g	1.00U pCi/g
LT-R-003**	Thorium-230	0.613 pCi/g	1.00U pCi/g

These results can be used for project objectives as nondetect (U) which may have a minor impact on the data usability.

FB023 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Radium-226

No isotopes were detected above the minimum detectable activity (MDA).

FB023 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Radium-228

No isotopes were detected above the minimum detectable activity (MDA).

FB023 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Chemical Recovery

All criteria were met.

Laboratory Duplicate Results

The laboratory performed duplicate analysis on samples CC-C-013-4-6 for gamma spectroscopy and alpha spectroscopy and FB023 for gamma spectroscopy and radium-226. All criteria were met.

Field Duplicate Results

A field duplicate pair was not associated with this sample set. Validation action was not required on this basis.

LCS Results

All criteria were met.

Detection Limits Results

All minimum detectable activities met required detection limits.

Sample Quantitation Results

Calculations were spot-checked; no discrepancies were noted.

DATA VALIDATION QUALIFIERS

- U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.
- J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified “J” data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The ‘J’ data may be biased high or low or the direction of the bias may be indeterminable.
- UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified “UJ” data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The ‘UJ’ data may be biased low.
- R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

LDC #: 31626B35
 SDG #: 160-5606-1
 Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET Cat A/Cat B

Date: 4-17-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer: GA

METHOD: Gamma Spectroscopy (Method GA-01-R)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-12-14 through 2-14-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	SW	
V.	Matrix Spike/(Matrix Spike) Duplicates	A	DUP
VI.	Laboratory control samples	A	LCS
VII.	Minimum detectable activity (MDA)	A	
VIII.	Sample result verification	A	Not reviewed for Cat A review.
IX.	Overall assessment of data	A	
X.	Field duplicates	N	
XI.	Field blanks (KRL)	ND	FB = 2

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

1	CC-C-013-4-6	S	11		21		31	
2	FB023	W	12		22		32	
3	CC-C-33-4-6	S	13		23		33	
4	CC-C-36-4-6		14		24		34	
5	LT-R-003 **		15		25		35	
6	CC-C-013-4-6DUP	↓	16		26		36	
7	FB023DUP	W	17		27		37	
8			18		28		38	
9			19		29	1	39	PBS
10			20		30	2	40	PBW

Notes: _____

LDC #: 31626B35
SDG #:

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: MG
2nd Reviewer:

Method: Radiochemistry (EPA Method GA-01-R)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. Calibration				
Were all instruments and detectors calibration as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were NIST traceable standards used for all calibrations?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was the check source identified by activity and radionuclide?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
III. Blanks				
Were blank analyses performed as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP (Soil) / (Water)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Was a duplicate sample analyzed at the required frequency of 5% in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all duplicate sample duplicate error ratios (DER) ≤ 1.42 ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were tracer/carrier recoveries within the QC limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the Minimum Detectable Activities (MDA) $< RL$?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

LDC #: 31626B35
SDG #: —

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: MG
2nd Reviewer: cr

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
X. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field duplicates.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
XI. Field blanks				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field blanks.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

VALIDATION FINDINGS WORKSHEET

Blanks

METHOD: Radiochemistry, Method GA-01-R

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

☒ N N/A Were blank analyses performed as required? If no, please see qualifications below.☒ N N/A Were any activities in the blanks greater than the minimum detectable activity? If yes, please see qualifications below.

Conc. units: pCi/L

Associated Samples: all water (ND)

Isotope	Blank ID	Blank Action Limit	Sample Identification										
	PB		No Qual.										
Pb-214	13.62												

Conc. units: pCi/g

Associated Samples: all soil

Isotope	Blank ID	Blank Action Limit	Sample Identification										
	PB		1	3	4	5							
Ac-228	0.01787												
Ra-228	0.01787		0.587/1.00U	0.781/1.00U	0.535/1.00U	0.531/1.00U							

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:

All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 31626B35

SDG #: —

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page: 1 of 1

Reviewer: MG

2nd Reviewer: 2

METHOD: Radiochemistry (Method: GA-01-R)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recalculated using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$

Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R or RPD	%R or RPD	
LCS	Laboratory control sample	Co-60	39.00 (pci/g)	41.8 (pci/g)	93	93	Y
—	Matrix spike sample	—	—	—	—	—	—
6	Duplicate RPD	Bi-214	0.460 (pci/g) ± 0.0553	0.4348 (pci/g) ± 0.0491	RER 0.24	RER 0.24	Y
—	Chemical recovery	—	—	—	—	—	—

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31626B36
 SDG #: 160-5606-1
 Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET Cat A/Cat B

Date: 4-17-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer: CV

METHOD: Alpha Spectroscopy (Method A-01-R)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-12-14 through 2-14-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	SW	
V.	Matrix Spike/(Matrix Spike) Duplicates	A	DUP
VI.	Laboratory control samples	A	LCS/LCSD
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	A	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks	ND	FB = 2

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

1	CC-C-013-4-6	S	11		21		31	
2	FB023	W	12		22		32	
3	CC-C-33-4-6	S	13		23		33	
4	CC-C-36-4-6		14		24		34	
5	LT-R-003 **		15		25		35	
6	CC-C-013-4-6DUP		16		26		36	
7			17		27		37	
8			18		28		38	
9			19		29	1 PBS	39	
10			20		30	2 PBW	40	

Notes:

LDC #: 31626B36
SDG #:

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: MG
2nd Reviewer:

Method: Radiochemistry(EPA Method A-01-R)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.	✓			
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD, or MS/DUP. (Soil, Water)		✓		
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Was a duplicate sample analyzed at the required frequency of 5% in this SDG?	✓			
Were all duplicate sample duplicate error ratios (DER) ≤ 1.42 ?	✓			
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%?	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	✓			
Were tracer/carrier recoveries within the QC limits?	✓			
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) $< RL$?	✓			

LDC #: 31626B36
SDG #: —

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: MG
2nd Reviewer: W

Validation Area	Yes	No	NA	Findings/Comments
D. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
X. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field duplicates.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
XI. Field blanks				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field blanks.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

VALIDATION FINDINGS WORKSHEET
Blanks**METHOD:** Radiochemistry, Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

☒ **N** N/A Were blank analyses performed as required? If no, please see qualifications below.☒ **N** N/A Were any activities in the blanks greater than the minimum detectable activity? If yes, please see qualifications below.**Conc. units:** pCi/g**Associated Samples:** all soil

Isotope	Blank ID	Blank Action Limit	Sample Identification										
			1	4	5								
	PB												
Th-230	0.1046		0.463/1.00U	0.542/1.00U	0.613/1.00U								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:

All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 31626836

SDG #: —

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page: 1 of 1

Reviewer: MG

2nd Reviewer: 2

METHOD: Radiochemistry (Method: A-01-R)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recalculated using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$

Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R or RPD	%R or RPD	
LCS	Laboratory control sample	U-233/234	5.976 (pCi/g)	6.37 (pCi/g)	94	94	Y
—	Matrix spike sample	—	—	—	—	—	—
6	Duplicate RPD	U-238	0.491 (pCi/g) ± 0.165	0.405 (pCi/g) ± 0.148	RER 0.27	RER 0.27	Y
5	Chemical recovery	Th-229	11.204 (dpm)	13.59 (dpm)	82.4	82.8	↓

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31626B29a
 SDG #: 160-5606-1
 Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET Cat A/Cat B

Date: 4-17-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer: a

METHOD: Radium 226 (EPA Method 903.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-14-14
II.	Initial calibration	N	Not reviewed for Cat A review.
III.	Calibration verification	N	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	A	DUP
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	N	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks	ND	FB= 1

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

water

1	FB023	11		21		31	
2	FB023DUP	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBW	40	

Notes:

LDC #: 31626B29b
 SDG #: 160-5606-1
 Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET Cat A/Cat B

Date: 4-17-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer: n

METHOD: Radium 228 (EPA Method 904.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-14-14
II.	Initial calibration	N	Not reviewed for Cat A review.
III.	Calibration verification	N	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	not required
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	N	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks	ND	FB = 1

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

water

1	FB023	11		21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBW	40	

Notes: _____

Site: Glen Isle
Laboratory: Test America St. Louis, MO
Report No.: 160-5651-1
Reviewer: Christina Rink and Mark Gregg/Laboratory Data Consultants for RXR
Glen Isle Partners, LLC
Date: April 21, 2014

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
LT-XC-021-4-6**	160-5651-1	Gamma Spectroscopy**, Alpha Spectroscopy**
LT-XC-023-8-10	160-5651-2	Gamma Spectroscopy, Alpha Spectroscopy
FB025	160-5651-3	Gamma Spectroscopy, Alpha Spectroscopy, Ra-226, Ra-228
LT-XC-021-4-6DUP	160-5651-1DUP	Gamma Spectroscopy, Alpha Spectroscopy
FB025DUP	160-5651-3DUP	Gamma Spectroscopy, Ra-226

Associated QC Samples(s):

Field Blanks: FB025, FB026 (from SDG 160-5691-1)

Field Duplicate pair: None Associated

The above-listed water and soil samples were collected from February 18, 2014 through February 19, 2014 and were analyzed for gamma spectroscopy by method GA-01-R, alpha spectroscopy for isotopic thorium and isotopic uranium by method A-01-R, Radium-226 by EPA Method 903.0, and Radium-228 by EPA Method 904.0. The data validation was performed in accordance with the *Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual* (July 2004) and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, EPA 540-R-10-011* (January 2010), modified as necessary to accommodate the non-CLP methodologies used.

The radiometric data were evaluated based on the following parameters:

- Overall Evaluation of Data and Potential Usability Issues
- Data Completeness
- Holding Times
- Instrument Calibration
- Blank Analysis Results
- Chemical Recovery
- Laboratory Duplicate Results
- Field Duplicate Results
- Laboratory Control Sample (LCS) Results
- Detection Limits Results
- Sample Quantitation Results

Overall Evaluation of Data and Potential Usability Issues

All results are usable as reported or usable with minor qualification due to laboratory quality control outliers.

Samples indicated by a double asterisk on the front cover underwent Category B review. A Category A review was performed on all of the other samples. Calibration and raw data were not evaluated for the samples reviewed by Category A criteria since this review is based on QC data.

The validation findings were based on the following information.

Data Completeness

The data package was complete as defined under the requirements for the NYSDEC ASP category B laboratory deliverables.

Holding Times

All holding times were met.

Instrument Calibration

All criteria were met for samples on which a Category B review was performed. Calibration data were not evaluated for the samples reviewed by Category A criteria.

Blank Results

Gamma Spectroscopy

No isotopes were detected above the minimum detectable activity (MDA).

FB025 and FB026 (from SDG 160-5651-1) were identified as field blanks. No analytes were detected above the reporting limits in the field blank samples.

Alpha Spectroscopy

Isotopes were detected above the minimum detectable activity (MDA). The presence of activity indicates that false positives may exist for these isotopes in the associated samples. Action Levels (ALs) were established at < RL. The following table summarizes the activities detected.

Blank ID	Isotope	Level Detected	Action Level	Associated Samples
PB (prep blank)	Thorium-230	0.07902 pCi/g	<RL	LT-XC-021-4-6** LT-XC-023-8-10

Sample results were qualified as follows:

- If sample concentration was < the reporting limit (RL) and \leq the Action Level, qualify the result as a nondetect (U) at the RL.
- If sample concentration was > the RL and \leq the Action Level, qualify the result as not detected (U) at the reported concentration.
- If the sample concentration was > the RL and > the Action Level, qualification of the data was not required.

Qualified sample results are listed in the table below.

Sample	Analyte	Reported Level	Validation Action
LT-XC-021-4-6	Thorium-230	0.270 pCi/g	1.00U pCi/g
LT-XC-023-8-10	Thorium-230	0.449 pCi/g	1.00U pCi/g

These results can be used for project objectives as nondetect (U) which may have a minor impact on the data usability.

FB025 and FB026 (from SDG 160-5691-1) were identified as field blanks. No analytes were detected above the reporting limits in the field blank samples.

Radium-226

No isotopes were detected above the minimum detectable activity (MDA).

FB025 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Radium-228

No isotopes were detected above the minimum detectable activity (MDA).

FB025 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Chemical Recovery

All criteria were met.

Laboratory Duplicate Results

The laboratory performed duplicate analysis on samples LT-XC-021-4-6** for gamma spectroscopy and alpha spectroscopy and FB025 for gamma spectroscopy and radium-226. All criteria were met.

Field Duplicate Results

A field duplicate pair was not associated with this sample set. Validation action was not required on this basis.

LCS Results

All criteria were met.

Detection Limits Results

All minimum detectable activities met required detection limits.

Sample Quantitation Results

Calculations were spot-checked; no discrepancies were noted.

DATA VALIDATION QUALIFIERS

- U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.
- J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.
- UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.
- R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

LDC #: 31626C35
 SDG #: 160-5651-1
 Laboratory : Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET Cat A/Cat B

Date: 4-17-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer: a

METHOD: Gamma Spectroscopy (Method GA-01-R)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-18-14 through 2-19-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates 9MA	SWA	DUP
VI.	Laboratory control samples	A	LCS
VII.	Minimum detectable activity (MDA)	A	
VIII.	Sample result verification	A	Not reviewed for Cat A review.
IX.	Overall assessment of data	A	
X.	Field duplicates	N	
XI.	Field blanks	ND	FB=3, FB=FB026

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

SDG: 160-5691-1

Validated Samples: ** Indicates sample underwent Cat B review.

1	LT-XC-021-4-6 **	S	11		21		31	
2	LT-XC-023-8-10	↓	12		22		32	
3	2 FB025	W	13		23		33	
4	LT-XC-021-4-6DUP	S	14		24		34	
5	2 FB025DUP	W	15		25		35	
6			16		26		36	
7			17		27		37	
8			18		28		38	
9			19		29	1 PBS	39	
10			20		30	2 PBW	40	

Notes: _____

LDC #: 31626C35
SDG #:

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: MG
2nd Reviewer: OL

Method: Radiochemistry (EPA Method GA-01-R)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP (<u>Sol</u>) (<u>Water</u>)		✓		
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Was a duplicate sample analyzed at the required frequency of 5% in this SDG?	✓			
Were all duplicate sample duplicate error ratios (DER) ≤ 1.42 ?	✓			
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%?	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?		✓		
Were tracer/carrier recoveries within the QC limits?			✓	
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) $< RL$?	✓			

LDC #: 31626C35
SDG #: —

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: MG
2nd Reviewer: CR

Validation Area	Yes	No	NA	Findings/Comments
IX: Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
X: Field duplicates				
Field duplicate pairs were identified in this SDG.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field duplicates.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
XI: Field blanks				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field blanks.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

LDC #: 31626C35

SDG #: —

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page: 1 of 1

Reviewer: MG

2nd Reviewer: 

METHOD: Radiochemistry (Method: GA-01-R)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recalculated using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$

Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R or RPD	%R or RPD	
LCS	Laboratory control sample	Am-241	97.87 (pci/g)	101 (pci/g)	97	97	Y
—	Matrix spike sample	—	—	—	—	—	—
4	Duplicate RPD	Pa-231	-0.07494 (pci/g) ± 0.0800	0.048444 (pci/g) ± 0.0287	RER 1.13	RER 1.14	Y
—	Chemical recovery	—	—	—	—	—	—

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31626C36

VALIDATION COMPLETENESS WORKSHEET

Date: 4-17-14

SDG #: 160-5651-1

Cat A/Cat B

Page: 1 of 1

Laboratory: Test America, Inc.

Reviewer: MG

2nd Reviewer: **METHOD:** Alpha Spectroscopy (Method A-01-R)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-18-14 through 2-19-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	SW	
V.	Matrix Spike/(Matrix Spike) Duplicates	A	DUP
VI.	Laboratory control samples	A	LCS/LCSD
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	A	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks (\leq RL)	ND	FB = 3, FB = FB026

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

1	LT-XC-021-4-6 ** S	11		21		31	
2	LT-XC-023-8-10 ↓	12		22		32	
3 2	FB025 W	13		23		33	
4	LT-XC-021-4-6DUP S	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29 1	PBS	39	
10		20		30 2	PBW	40	

Notes: _____

LDC #: 31626C36
SDG #:

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: MG
2nd Reviewer:

Method: Radiochemistry(EPA Method A-01-R)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.	✓			
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP (Soil/ Water).		✓		
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Was a duplicate sample analyzed at the required frequency of 5% in this SDG?	✓			
Were all duplicate sample duplicate error ratios (DER) ≤ 1.427 .	✓			
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	✓			
Were tracer/carrier recoveries within the QC limits?	✓			
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) $< RL$?	✓			

LDC #: 31626C36
SDG #: —

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: MG
2nd Reviewer: OR

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
X. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field duplicates.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
XI. Field blanks				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field blanks.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

LDC #: 31626C36

VALIDATION FINDINGS WORKSHEET

BlanksPage: 1 of 1Reviewer: MG2nd Reviewer: 9METHOD: Radiochemistry, Method A-01-R

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

☒ N N/A Were blank analyses performed as required? If no, please see qualifications below.☒ N N/A Were any activities in the blanks greater than the minimum detectable activity? If yes, please see qualifications below.Conc. units: pCi/gAssociated Samples: all soil

Isotope	Blank ID	Blank Action Limit	Sample Identification										
			1	2									
	PB												
Th-230	0.07902		0.270/1.00U	0.449/1.00U									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:

All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 31626C36
SDG #: —

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: MG
2nd Reviewer: g

METHOD: Radiochemistry (Method: A-01-R)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recalculated using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$
 Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$
 Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R or RPD	%R or RPD	
LCS	Laboratory control sample	Th-230	25.14 (pCi/g)	24.5 (pCi/g)	103	103	Y
—	Matrix spike sample	—	—	—	—	—	—
4	Duplicate RPD	Th-228	0.258 (pCi/g) ± 0.122	0.1252 (pCi/g) ± 0.0769	RER 0.67	RER 0.67	Y
1	Chemical recovery	U-232	13.024 (dpm)	16.45 (dpm)	79.2	81.0	↓

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31626C29a
 SDG #: 160-5651-1
 Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET Cat A/Cat B

Date: 4-17-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer:

METHOD: Radium 226 (EPA Method 903.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-18-14
II.	Initial calibration	N	Not reviewed for Cat A review.
III.	Calibration verification	N	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	A	DUP
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification <i>gmH</i>	<i>A</i> N	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks	ND	FB = 1

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

water

1	FB025	11		21		31	
2	FB025DUP	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBW	40	

Notes: _____

LDC #: 31626C29b
 SDG #: 160-5651-1
 Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET Cat A/Cat B

Date: 4-17-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer: [Signature]

METHOD: Radium 228 (EPA Method 904.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-18-14
II.	Initial calibration	N	Not reviewed for Cat A review.
III.	Calibration verification	N	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	not required
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	N	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks	ND	FB = 1

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.
 Water

1	FB025	11		21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBW	40	

Notes: _____

Site: Glen Isle
Laboratory: Test America St. Louis, MO
Report No.: 160-5691-1
Reviewer: Christina Rink and Mark Gregg/Laboratory Data Consultants for RXR
Glen Isle Partners, LLC
Date: April 21, 2014

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
FB026	160-5691-1	Gamma Spectroscopy, Alpha Spectroscopy, Ra-226, Ra-228
FB026DUP	160-5691-1DUP	Gamma Spectroscopy

Associated QC Samples(s):

Field Blanks: FB026

Field Duplicate pair: None Associated

The above-listed water samples were collected on February 19, 2014 and were analyzed for gamma spectroscopy by method GA-01-R, alpha spectroscopy for isotopic thorium and isotopic uranium by method A-01-R, Radium-226 by EPA Method 903.0, and Radium-228 by EPA Method 904.0. The data validation was performed in accordance with the *Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual* (July 2004) and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, EPA 540-R-10-011* (January 2010), modified as necessary to accommodate the non-CLP methodologies used.

The radiometric data were evaluated based on the following parameters:

- Overall Evaluation of Data and Potential Usability Issues
- Data Completeness
- Holding Times
- Instrument Calibration
- Blank Analysis Results
- Chemical Recovery
- Laboratory Duplicate Results
- Field Duplicate Results
- Laboratory Control Sample (LCS) Results
- Detection Limits Results
- Sample Quantitation Results

Overall Evaluation of Data and Potential Usability Issues

All results are usable as reported.

Calibration and raw data were not evaluated for the samples reviewed by Category A criteria since this review is based on QC data.

The validation findings were based on the following information.

Data Completeness

The data package was complete as defined under the requirements for the NYSDEC ASP category A laboratory deliverables.

Holding Times

All holding times were met.

Instrument Calibration

Calibration data were not evaluated for the samples reviewed by Category A criteria.

Blank Results

Gamma Spectroscopy

No isotopes were detected above the minimum detectable activity (MDA).

FB026 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Alpha Spectroscopy

No isotopes were detected above the minimum detectable activity (MDA).

FB026 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Radium-226

No isotopes were detected above the minimum detectable activity (MDA).

FB026 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Radium-228

No isotopes were detected above the minimum detectable activity (MDA).

FB026 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Chemical Recovery

All criteria were met.

Laboratory Duplicate Results

The laboratory performed duplicate analysis on sample FB026 for gamma spectroscopy. All criteria were met.

Field Duplicate Results

A field duplicate pair was not associated with this sample set. Validation action was not required on this basis.

LCS Results

All criteria were met.

Detection Limits Results

All minimum detectable activities met required detection limits.

Sample Quantitation Results

Calculations were spot-checked; no discrepancies were noted.

DATA VALIDATION QUALIFIERS

- U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.
- J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.
- UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.
- R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

LDC #: 31626D35
 SDG #: 160-5691-1
 Laboratory : Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET

Cat A/Cat B

Date: 4-17-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer:

METHOD: Gamma Spectroscopy (Method GA-01-R)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-19-14
II.	Initial calibration	N	Not reviewed for Cat A review.
III.	Calibration verification	N	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	A	DUP
VI.	Laboratory control samples	A	LCS
VII.	Minimum detectable activity (MDA)	A	
VIII.	Sample result verification	N	Not reviewed for Cat A review.
IX.	Overall assessment of data	A	
X.	Field duplicates	N	
XI.	Field blanks	ND	FB = 1

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

Water

1	FB026	11		21		31	
2	FB026DUP	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBW	40	

Notes:

LDC #: 31626D36
 SDG #: 160-5691-1
 Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET

Cat A/Cat B

Date: 4-17-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer: CR

METHOD: Alpha Spectroscopy (Method A-01-R)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-19-14
II.	Initial calibration	N	Not reviewed for Cat A review.
III.	Calibration verification	N	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	not required
VI.	Laboratory control samples	A	LCS/LCSD
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	N	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks (< RL)	ND	FB = 1

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

Water

1	FB026	11		21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBW	40	

Notes:

LDC #: 31626D29a
 SDG #: 160-5691-1
 Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET Cat A/Cat B

Date: 4-17-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer: [Signature]

METHOD: Radium 226 (EPA Method 903.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-19-14
II.	Initial calibration	N	Not reviewed for Cat A review.
III.	Calibration verification	N	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	not required
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	N	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks	ND	FB = 1

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet
 ND = No compounds detected
 R = Rinsate
 FB = Field blank
 D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

Water

1	FB026	11		21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBW	40	

Notes: _____

LDC #: 31626D29b
 SDG #: 160-5691-1
 Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET Cat A/Cat B

Date: 4-17-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer: CA

METHOD: Radium 228 (EPA Method 904.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-19-14
II.	Initial calibration	N	Not reviewed for Cat A review.
III.	Calibration verification	N	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	not required
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	N	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks	ND	FB = 1

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet
 ND = No compounds detected
 R = Rinsate
 FB = Field blank
 D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

water

1	FB026	11		21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBW	40	

Notes: _____

Site: Glen Isle
Laboratory: Test America St. Louis, MO
Report No.: 160-5692-1
Reviewer: Christina Rink and Mark Gregg/Laboratory Data Consultants for RXR
Glen Isle Partners, LLC
Date: April 21, 2014

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
LT-XC-020-6-8**	160-5692-1	Gamma Spectroscopy**, Alpha Spectroscopy**
CC-C-042-6-8	160-5692-2	Gamma Spectroscopy, Alpha Spectroscopy
CC-C-043-10-12	160-5692-3	Gamma Spectroscopy, Alpha Spectroscopy
CC-C-044-6-8	160-5692-4	Gamma Spectroscopy, Alpha Spectroscopy
FB027	160-5692-5	Gamma Spectroscopy, Alpha Spectroscopy, Ra-226, Ra-228
CC-C-045-6-8	160-5692-6	Gamma Spectroscopy, Alpha Spectroscopy
LT-C-048-2-4	160-5692-7	Gamma Spectroscopy, Alpha Spectroscopy
CC-C-046-6-8	160-5692-8	Gamma Spectroscopy, Alpha Spectroscopy
LT-C-049-2-4	160-5692-9	Gamma Spectroscopy, Alpha Spectroscopy
LT-XC-020-6-8DUP	160-5692-1DUP	Gamma Spectroscopy, Alpha Spectroscopy

Associated QC Samples(s):

Field Blanks: FB027

Field Duplicate pair: None Associated

The above-listed water and soil samples were collected on February 20, 2014 and were analyzed for gamma spectroscopy by method GA-01-R, alpha spectroscopy for isotopic thorium and isotopic uranium by method A-01-R, Radium-226 by EPA Method 903.0, and Radium-228 by EPA Method 904.0. The data validation was performed in accordance with the *Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual* (July 2004) and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, EPA 540-R-10-011* (January 2010), modified as necessary to accommodate the non-CLP methodologies used.

The radiometric data were evaluated based on the following parameters:

- Overall Evaluation of Data and Potential Usability Issues
- Data Completeness
- Holding Times
- Instrument Calibration
- Blank Analysis Results
- Chemical Recovery
- Laboratory Duplicate Results
- Field Duplicate Results
- Laboratory Control Sample (LCS) Results
- Detection Limits Results
- Sample Quantitation Results

Overall Evaluation of Data and Potential Usability Issues

All results are usable as reported.

Samples indicated by a double asterisk on the front cover underwent Category B review. A Category A review was performed on all of the other samples. Calibration and raw data were not evaluated for the samples reviewed by Category A criteria since this review is based on QC data.

The validation findings were based on the following information.

Data Completeness

The data package was complete as defined under the requirements for the NYSDEC ASP category B laboratory deliverables.

Holding Times

All holding times were met.

Instrument Calibration

All criteria were met for samples on which a Category B review was performed. Calibration data were not evaluated for the samples reviewed by Category A criteria.

Blank Results

Gamma Spectroscopy

No isotopes were detected above the minimum detectable activity (MDA).

FB027 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Alpha Spectroscopy

No isotopes were detected above the minimum detectable activity (MDA).

FB027 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Radium-226

No isotopes were detected above the minimum detectable activity (MDA).

FB027 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Radium-228

Radium-228

No isotopes were detected above the minimum detectable activity (MDA).

FB027 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Chemical Recovery

All criteria were met.

Laboratory Duplicate Results

The laboratory performed duplicate analysis on sample LT-XC-020-6-8** for gamma spectroscopy and alpha spectroscopy. All criteria were met.

Field Duplicate Results

A field duplicate pair was not associated with this sample set. Validation action was not required on this basis.

LCS Results

All criteria were met.

Detection Limits Results

All minimum detectable activities met required detection limits.

Sample Quantitation Results

Calculations were spot-checked; no discrepancies were noted.

DATA VALIDATION QUALIFIERS

- U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.
- J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified “J” data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The ‘J’ data may be biased high or low or the direction of the bias may be indeterminable.
- UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified “UJ” data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The ‘UJ’ data may be biased low.
- R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

LDC #: 31626E35
 SDG #: 160-5692-1
 Laboratory : Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET Cat A/Cat B

Date: 4-17-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer: [Signature]

METHOD: Gamma Spectroscopy (Method GA-01-R)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-20-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	A	DUP
VI.	Laboratory control samples	A	LCS
VII.	Minimum detectable activity (MDA)	A	
VIII.	Sample result verification	A	Not reviewed for Cat A review.
IX.	Overall assessment of data	A	
X.	Field duplicates	N	
XI.	Field blanks	ND	FB = 5

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

1	LT-XC-020-6-8 ** S	11		21		31	
2	CC-C-042-6-8	12		22		32	
3	CC-C-043-10-12	13		23		33	
4	CC-C-044-6-8	14		24		34	
5	FB027 W	15		25		35	
6	CC-C-045-6-8 S	16		26		36	
7	LT-C-048-2-4	17		27		37	
8	CC-C-046-6-8	18		28		38	
9	LT-C-049-2-4	19		29		39	PBS
10	LT-XC-020-6-8DUP	20		30		40	PBW

Notes: _____

LDC #: 31626E35
SDG #:

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: MG
2nd Reviewer: OL

Method: Radiochemistry (EPA Method GA-01-R)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. Calibration				
Were all instruments and detectors calibration as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were NIST traceable standards used for all calibrations?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was the check source identified by activity and radionuclide?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
III. Blanks				
Were blank analyses performed as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / <u>Water</u> .	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Was a duplicate sample analyzed at the required frequency of 5% in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all duplicate sample duplicate error ratios (DER) ≤ 1.42 ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were tracer/carrier recoveries within the QC limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the Minimum Detectable Activities (MDA) < RL?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

LDC #: 31626E35
SDG #: —

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: MG
2nd Reviewer: Q

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
X. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field duplicates.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
XI. Field blanks				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field blanks.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

LDC #: 31626E35
SDG #: —

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: MG
2nd Reviewer: 2

METHOD: Radiochemistry (Method: GA-01-R)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recalculated using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$
 Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$
 Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R or RPD	%R or RPD	
LCS	Laboratory control sample	Cs-137	35.59 (pci/g)	35.7 (pci/g)	100	100	Y
—	Matrix spike sample	—	—	—	—	—	—
10	Duplicate RPD	Pa-234m	1.69 (pci/g) ± 0.717	1.423 (pci/g) ± 0.754	RER 0.18	RER 0.18	Y
—	Chemical recovery	—	—	—	—	—	—

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31626E36
 SDG #: 160-5692-1
 Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET Cat A/Cat B

Date: 4-17-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer: OL

METHOD: Alpha Spectroscopy (Method A-01-R)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-20-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	A	DUP
VI.	Laboratory control samples	A	LCS/LCSD
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	A	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks (<RL)	ND	FB = 5

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

1	LT-XC-020-6-8 **	S	11		21		31	
2	CC-C-042-6-8	↓	12		22		32	
3	CC-C-043-10-12	↓	13		23		33	
4	CC-C-044-6-8	↓	14		24		34	
5	2 FB027	W	15		25		35	
6	CC-C-045-6-8	S	16		26		36	
7	LT-C-048-2-4	↓	17		27		37	
8	CC-C-046-6-8	↓	18		28		38	
9	LT-C-049-2-4	↓	19		29	1 PBS	39	
10	LT-XC-020-6-8DUP	↓	20		30	2 PBW	40	

Notes: _____

LDC #: 31626E36
SDG #: —

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: MG
2nd Reviewer: OR

Method: Radiochemistry (EPA Method A-01-R)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. (Soil) (Water)		✓		
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Was a duplicate sample analyzed at the required frequency of 5% in this SDG?	✓			
Were all duplicate sample duplicate error ratios (DER) ≤ 1.42 ?	✓			
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%?	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	✓			
Were tracer/carrier recoveries within the QC limits?	✓			
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) $< RL$?	✓			

LDC #: 31626E36
SDG #: —

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: MG
2nd Reviewer: OL

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
X. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field duplicates.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
XI. Field blanks				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field blanks.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

LDC #: 31626E36
SDG #: —

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: MG
2nd Reviewer: 9

METHOD: Radiochemistry (Method: A-01-R)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recalculated using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$

Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R or RPD	%R or RPD	
LCS	Laboratory control sample	U-238	6.500 (pCi/g)	6.51 (pCi/g)	100	100	Y
—	Matrix spike sample	—	—	—	—	—	—
10	Duplicate RPD	Th-232	0.349 (pCi/g) ± 0.132	0.2924 (pCi/g) ± 0.117	RER 0.23	RER 0.23	Y
1	Chemical recovery	Th-229	10.792 (dpm)	13.59 (dpm)	79.4	79.8	↓

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31626E29a
SDG #: 160-5692-1
Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET

Cat A/Cat B

Date: 4-17-14
Page: 1 of 1
Reviewer: MG
2nd Reviewer:

METHOD: Radium 226 (EPA Method 903.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-20-14
II.	Initial calibration	N	Not reviewed for Cat A review.
III.	Calibration verification	N	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	not required
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	N	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks	ND	FB = 1

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

water

1	FB027	11		21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBW	40	

Notes:

LDC #: 31626E29b
 SDG #: 160-5692-1
 Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET

Cat A/Cat B

Date: 4-17-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer: [Signature]

METHOD: Radium 228 (EPA Method 904.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-20-14
II.	Initial calibration	N	Not reviewed for Cat A review.
III.	Calibration verification	N	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	not required
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	N	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks	ND	FB = 1

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

water

1	FB027	11		21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBW	40	

Notes: _____

Site: Glen Isle
Laboratory: Test America St. Louis, MO
Report No.: 160-5697-1
Reviewer: Christina Rink and Mark Gregg/Laboratory Data Consultants for RXR
Glen Isle Partners, LLC
Date: April 21, 2014

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
LT-C-060-6-8**	160-5697-1	Gamma Spectroscopy**, Alpha Spectroscopy**
LT-G-028-8-10	160-5697-2	Gamma Spectroscopy, Alpha Spectroscopy
LT-G-029-4-6	160-5697-3	Gamma Spectroscopy, Alpha Spectroscopy
DUP028	160-5697-4	Gamma Spectroscopy, Alpha Spectroscopy
FB029	160-5697-5	Gamma Spectroscopy, Alpha Spectroscopy, Ra-226, Ra-228
FB029DUP	160-5697-5DUP	Ra-228

Associated QC Samples(s):

Field Blanks: FB029

Field Duplicate pair: LT-C-060-6-8** and DUP028

The above-listed water and soil samples were collected on February 24, 2014 and were analyzed for gamma spectroscopy by method GA-01-R, alpha spectroscopy for isotopic thorium and isotopic uranium by method A-01-R, Radium-226 by EPA Method 903.0, and Radium-228 by EPA Method 904.0. The data validation was performed in accordance with the *Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual* (July 2004) and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, EPA 540-R-10-011* (January 2010), modified as necessary to accommodate the non-CLP methodologies used.

The radiometric data were evaluated based on the following parameters:

- Overall Evaluation of Data and Potential Usability Issues
- Data Completeness
- Holding Times
- Instrument Calibration
- Blank Analysis Results
- Chemical Recovery
- Laboratory Duplicate Results
- Field Duplicate Results
- Laboratory Control Sample (LCS) Results
- Detection Limits Results
- Sample Quantitation Results

Overall Evaluation of Data and Potential Usability Issues

All results are usable as reported.

Samples indicated by a double asterisk on the front cover underwent Category B review. A Category A review was performed on all of the other samples. Calibration and raw data were not evaluated for the samples reviewed by Category A criteria since this review is based on QC data.

The validation findings were based on the following information.

Data Completeness

The data package was complete as defined under the requirements for the NYSDEC ASP category B laboratory deliverables.

Holding Times

All holding times were met.

Instrument Calibration

All criteria were met for samples on which a Category B review was performed. Calibration data were not evaluated for the samples reviewed by Category A criteria.

Blank Results

Gamma Spectroscopy

No isotopes were detected above the minimum detectable activity (MDA).

FB029 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Alpha Spectroscopy

No isotopes were detected above the minimum detectable activity (MDA).

FB029 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Radium-226

No isotopes were detected above the minimum detectable activity (MDA).

FB029 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Radium-228

No isotopes were detected above the minimum detectable activity (MDA).

FB029 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Chemical Recovery

All criteria were met.

Laboratory Duplicate Results

The laboratory performed duplicate analysis on sample FB029 for radium-228. All criteria were met.

Field Duplicate Results

Analytes were detected in the field duplicate samples. The following table summarizes the concentrations and validation actions taken.

Gamma Spectroscopy

Isotope	Concentration (pCi/g)		RPD (Limits)	Difference (Limits)	Validation Actions
	LT-C-060-6-8	DUP028			
Actinium-228	0.355	0.296	-	0.059 (≤ 0.200)	-
Bismuth-212	0.366	0.302	-	0.064 (≤ 0.200)	-
Bismuth-214	0.269	0.274	-	0.005 (≤ 0.200)	-
Lead-210	0.284	0.326	-	0.042 (≤ 0.200)	-
Lead-212	0.310	0.306	-	0.004 (≤ 0.200)	-
Lead-214	0.309	0.309	-	0 (≤ 0.200)	-
Potassium-40	12.1	7.90	-	4.2 (≤ 5.00)	-
Radium-226	0.701	0.727	-	0.026 (≤ 2.00)	-
Radium-228	0.355	0.296	-	0.059 (≤ 2.00)	-
Thorium-234	0.356	0.301	-	0.055 (≤ 2.00)	-
Thallium-208	0.108	0.106	-	0.002 (≤ 0.200)	-
Uranium-235	0.0542	0.0500	-	0.0042 (≤ 2.00)	-
Uranium-238	0.356	0.301	-	0.055 (≤ 2.00)	-
Protactinium-234m	1.24	0.930	-	0.31 (≤ 20.0)	-

--no action required

For soil results > 5xRL and RPDs >100; estimate (J) results in the field duplicate pair.

For soil results < 5xRL; the sample and duplicate results must be within 2XRL.

Alpha Spectroscopy

Iostope	Concentration (pCi/g)		RPD (Limits)	Difference (Limits)	Validation Actions
	LT-C-060-6-8	DUP028			
Thorium-228	0.388	0.472	-	0.084 (≤ 2.00)	-
Thorium-230	0.273	0.561	-	0.288 (≤ 2.00)	-
Thorium-232	0.394	0.576	-	0.182 (≤ 2.00)	-
Uranium-233/234	0.581	0.590	-	0.009 (≤ 2.00)	-
Uranium-238	0.418	0.614	-	0.196 (≤ 2.00)	-

--no action required

For soil results > 5xRL and RPDs >100; estimate (J) results in the field duplicate pair.

For soil results < 5xRL; the sample and duplicate results must be within 2XRL.

LCS Results

All criteria were met.

Detection Limits Results

All minimum detectable activities met required detection limits.

Sample Quantitation Results

Calculations were spot-checked; no discrepancies were noted.

DATA VALIDATION QUALIFIERS

- U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.
- J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified “J” data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The ‘J’ data may be biased high or low or the direction of the bias may be indeterminable.
- UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified “UJ” data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The ‘UJ’ data may be biased low.
- R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

LDC #: 31626F35
 SDG #: 160-5697-1
 Laboratory : Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET Cat A/Cat B

Date: 4-17-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer:

METHOD: Gamma Spectroscopy (Method GA-01-R)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-24-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	not required
VI.	Laboratory control samples	A	LCS
VII.	Minimum detectable activity (MDA)	A	
VIII.	Sample result verification	A	Not reviewed for Cat A review.
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	D = 1+4
XI.	Field blanks	ND	FB = 5

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet
 ND = No compounds detected
 R = Rinsate
 FB = Field blank
 D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

1	LT-C-060-6-8 ** S	11		21		31	
2	LT-G-028-8-10	12		22		32	
3	LT-G-029-4-6	13		23		33	
4	DUP028	14		24		34	
5 2	FB029 W	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29 1	PBS	39	
10		20		30 2	PBW	40	

Notes: _____

LDC #: 31626F35
SDG #:

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: MG
2nd Reviewer: OL

Method: Radiochemistry(EPA Method GA-01-R)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD, or MS/DUP (Sol) / Water.		✓		
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Was a duplicate sample analyzed at the required frequency of 5% in this SDG?		✓		
Were all duplicate sample duplicate error ratios (DER) ≤ 1.42 ?			✓	
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%?	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?		✓		
Were tracer/carrier recoveries within the QC limits?			✓	
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) < RL?	✓			

LDC #: 31626F35
SDG #: —

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: MG
2nd Reviewer: G

Validation Area	Yes	No	NA	Findings/Comments
D: Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
X: Field duplicates				
Field duplicate pairs were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field duplicates.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XI: Field blanks				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field blanks.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

LDC#: 31626F35**VALIDATION FINDINGS WORKSHEET**
Field DuplicatesPage: 1 of 1
Reviewer: MG
2nd Reviewer: OR**METHOD:** Radiochemistry (Method: GA-01-R)

Isotope	Activity (pCi/g)		(≤100) RPD	Difference	Limits	Qualify Parent Only
	1	4				
Ac-228	0.355	0.296		0.059	(≤0.200)	
Bi-212	0.366	0.302		0.064	(≤0.200)	
Bi-214	0.269	0.274		0.005	(≤0.200)	
Pb-210	0.284	0.326		0.042	(≤0.200)	
Pb-212	0.310	0.306		0.004	(≤0.200)	
Pb-214	0.309	0.309		0	(≤0.200)	
K-40	12.1	7.90		4.2	(≤5.00)	
Ra-226	0.701	0.727		0.026	(≤2.00)	
Ra-228	0.355	0.296		0.059	(≤2.00)	
Th-234	0.356	0.301		0.055	(≤2.00)	
Tl-208	0.108	0.106		0.002	(≤0.200)	
U-235	0.0542	0.0500		0.0042	(≤2.00)	
U-238	0.356	0.301		0.055	(≤2.00)	
Pa-234m	1.24	0.930		0.31	(≤20.0)	

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LDC #: 31626F35
SDG #: —

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: MG
2nd Reviewer: —

METHOD: Radiochemistry (Method: GA-01-R)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recalculated using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$
 Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$
 Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R or RPD	%R or RPD	
LCS	Laboratory control sample	Co-60	41.32 (pCi/g)	41.7 (pCi/g)	99	99	Y
—	Matrix spike sample	—	—	—	—	—	—
—	Duplicate RPD	—	—	—	—	—	—
—	Chemical recovery	—	—	—	—	—	—

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

SDG #: _____

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: 1 of 1

Reviewer: MG

2nd reviewer: a

METHOD: Radiochemistry (Method: GA-01-R)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Have results been reported and calculated correctly?

Y N N/A Are results within the calibrated range of the instruments?

Analyte results for #1, Pa-234m reported with a positive detect were recalculated and verified using the following equation:

Activity =

Recalculation:

$$\frac{(\text{cpm} - \text{bckgrd cpm})}{(2.22)(E)(Vol)(CF)}$$

$$\frac{(40.40 \text{ dps})(27.03 \text{ PCi/dps})}{878.1 \text{ g}} = 1.2436 \text{ PCi/g}$$

E = Efficiency

Vol = Volume

CF = %R, Self-absorbance, abundance, ect.

[illegible]

Note: _____

LDC #: 31626F36
 SDG #: 160-5697-1
 Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET Cat A/Cat B

Date: 4-17-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer: [Signature]

METHOD: Alpha Spectroscopy (Method A-01-R)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-24-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	not required
VI.	Laboratory control samples	A	LCS / LCSD
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	A	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	SW	D = 1 + 4
XII.	Field blanks (< RL)	ND	FB = 5

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

1	LT-C-060-6-8 **	S	11		21		31	
2	LT-G-028-8-10		12		22		32	
3	LT-G-029-4-6		13		23		33	
4	DUP028		14		24		34	
5	2 FB029	W	15		25		35	
6			16		26		36	
7			17		27		37	
8			18		28		38	
9			19		29	1 PBS	39	
10			20		30	2 PBW	40	

Notes: _____

LDC #: 31626F36
SDG #:

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: MG
2nd Reviewer:

Method: Radiochemistry(EPA Method A-01-R)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD, or MS/DUP (Soil/ Water)		✓		
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Was a duplicate sample analyzed at the required frequency of 5% in this SDG?		✓		
Were all duplicate sample duplicate error ratios (DER) ≤ 1.42 ?			✓	
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	✓			
Were tracer/carrier recoveries within the QC limits?	✓			
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) < RL?	✓			

LDC #: 31626F36
SDG #: —

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: MG
2nd Reviewer: AL

Validation Area	Yes	No	NA	Findings/Comments
D: Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
X: Field duplicates				
Field duplicate pairs were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field duplicates.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XI: Field blanks				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field blanks.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

LDC#: 31626F36**VALIDATION FINDINGS WORKSHEET**
Field DuplicatesPage: 1 of 1
Reviewer: MG
2nd Reviewer: OL**METHOD:** Radiochemistry (Method: A-01-R)

Isotope	Activity (pCi/g)		(≤100) RPD	Difference	Limits	Qualify Parent Only
	1	4				
Th-228	0.388	0.472		0.084	(≤2.00)	
Th-230	0.273	0.561		0.288	(≤2.00)	
Th-232	0.394	0.576		0.182	(≤2.00)	
U-233/234	0.581	0.590		0.009	(≤2.00)	
U-238	0.418	0.614		0.196	(≤2.00)	

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LDC #: 31626F36
SDG #: —

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: MG
2nd Reviewer: Q

METHOD: Radiochemistry (Method: A-01-R)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recalculated using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$

Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R or RPD	%R or RPD	
LCS	Laboratory control sample	Tn-230	24.54 (pCi/g)	24.5 (pCi/g)	100	100	Y
—	Matrix spike sample	—	—	—	—	—	—
—	Duplicate RPD	—	—	—	—	—	—
1	Chemical recovery	U-232	13.934 (dpm)	16.45 (dpm)	84.7	86.7	Y

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31626F29a
 SDG #: 160-5697-1
 Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET

Cat A/Cat B

Date: 4-17-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer: OL

METHOD: Radium 226 (EPA Method 903.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-24-14
II.	Initial calibration	N	Not reviewed for Cat A review.
III.	Calibration verification	N	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	not required
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	N	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks	ND	FB = 1

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet
 ND = No compounds detected
 R = Rinsate
 FB = Field blank
 D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

water

1	FB029	11		21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBW	40	

Notes:

LDC #: 31626F29b
 SDG #: 160-5697-1
 Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET

Cat A/Cat B

Date: 4-17-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer:

METHOD: Radium 228 (EPA Method 904.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-24-14
II.	Initial calibration	N	Not reviewed for Cat A review.
III.	Calibration verification	N	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	A	DUP
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	N	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks	ND	FB = 1

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

water

1	FB029	11		21		31	
2	FB029DUP	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBW	40	

Notes:

Site: Glen Isle
Laboratory: Test America St. Louis, MO
Report No.: 160-5703-1
Reviewer: Christina Rink and Mark Gregg/Laboratory Data Consultants for RXR
Glen Isle Partners, LLC
Date: April 21, 2014

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
CC-C-048-2-4**	160-5703-1	Gamma Spectroscopy**, Alpha Spectroscopy**
CC-C-050-0-2	160-5703-2	Gamma Spectroscopy, Alpha Spectroscopy
LT-G-026-4-6	160-5703-3	Gamma Spectroscopy, Alpha Spectroscopy
LT-G-027-8-10	160-5703-4	Gamma Spectroscopy, Alpha Spectroscopy
FB028	160-5703-5	Gamma Spectroscopy, Alpha Spectroscopy, Ra-226, Ra-228
FB028DUP	160-5703-5DUP	Ra-226

Associated QC Samples(s):

Field Blanks: FB028

Field Duplicate pair: None Associated

The above-listed water and soil samples were collected on February 21, 2014 and were analyzed for gamma spectroscopy by method GA-01-R, alpha spectroscopy for isotopic thorium and isotopic uranium by method A-01-R, Radium-226 by EPA Method 903.0, and Radium-228 by EPA Method 904.0. The data validation was performed in accordance with the *Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual* (July 2004) and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, EPA 540-R-10-011* (January 2010), modified as necessary to accommodate the non-CLP methodologies used.

The radiometric data were evaluated based on the following parameters:

- Overall Evaluation of Data and Potential Usability Issues
- Data Completeness
- Holding Times
- Instrument Calibration
- Blank Analysis Results
- Chemical Recovery
- Laboratory Duplicate Results
- Field Duplicate Results
- Laboratory Control Sample (LCS) Results
- Detection Limits Results
- Sample Quantitation Results

Overall Evaluation of Data and Potential Usability Issues

All results are usable as reported or usable with minor qualification due to laboratory quality control outliers.

Samples indicated by a double asterisk on the front cover underwent Category B review. A Category A review was performed on all of the other samples. Calibration and raw data were not evaluated for the samples reviewed by Category A criteria since this review is based on QC data.

The validation findings were based on the following information.

Data Completeness

The data package was complete as defined under the requirements for the NYSDEC ASP category B laboratory deliverables.

Holding Times

All holding times were met.

Instrument Calibration

All criteria were met for samples on which a Category B review was performed. Calibration data were not evaluated for the samples reviewed by Category A criteria.

Blank Results

Gamma Spectroscopy

No isotopes were detected above the minimum detectable activity (MDA).

FB028 was identified as a field blank. Analytes were detected above the reporting limits in the field blank samples. The following table summarizes the contamination and validation actions taken.

Blank ID	Analyte	Level Detected	Action Level	Associated Samples
FB028	Protactinium-234m	664 pCi/L	6.64 pCi/g	CC-C-048-2-4** CC-C-050-0-2 LT-G-026-4-6 LT-G-027-8-10

Blank Actions for analytes detected above the reporting limit(RL).

If the sample result is < RL and < action level; report the result as nondetect (U) at the RL.

If the sample result is > RL and < action level; report the result as nondetect (U) at the reported value.

If the sample result is > action level or nondetect, no action is required.

Qualified sample results are listed in the table below.

Sample	Analyte	Reported Level	Validation Action
LT-G-027-8-10	Protactinium-234m	1.47 pCi/g	10.0U pCi/g

These results can be used for project objectives as nondetect (U) which may have a minor impact on the data usability.

Alpha Spectroscopy

No isotopes were detected above the minimum detectable activity (MDA).

FB028 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Radium-226

No isotopes were detected above the minimum detectable activity (MDA).

FB028 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Radium-228

No isotopes were detected above the minimum detectable activity (MDA).

FB028 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Chemical Recovery

All criteria were met.

Laboratory Duplicate Results

The laboratory performed duplicate analysis on sample FB028 for radium-226. All criteria were met.

Field Duplicate Results

A field duplicate pair was not associated with this sample set. Validation action was not required on this basis.

LCS Results

All criteria were met.

Detection Limits Results

All minimum detectable activities met required detection limits.

Sample Quantitation Results


Calculations were spot-checked; no discrepancies were noted.

DATA VALIDATION QUALIFIERS

- U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.
- J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.
- UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.
- R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

LDC #: 31626G35
 SDG #: 160-5703-1
 Laboratory : Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET **Cat A/Cat B**

Date: 4-18-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer: 

METHOD: Gamma Spectroscopy (Method GA-01-R)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-21-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	not required
VI.	Laboratory control samples	A	LCS
VII.	Minimum detectable activity (MDA)	A	
VIII.	Sample result verification	A	Not reviewed for Cat A review.
IX.	Overall assessment of data	A	
X.	Field duplicates	N	
XI.	Field blanks (< RL)	SW	FB = 5

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet
 ND = No compounds detected
 R = Rinsate
 FB = Field blank
 D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

1	CC-C-048-2-4 **	S	11		21		31	
2	CC-C-050-0-2		12		22		32	
3	LT-G-026-4-6		13		23		33	
4	LT-G-027-8-10		14		24		34	
5	FB028	W	15		25		35	
6			16		26		36	
7			17		27		37	
8			18		28		38	
9			19		29	1 PBW	39	
10			20		30	2 PBS	40	

Notes: _____

LDC #: 31626G35
SDG #:

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: MG
2nd Reviewer:

Method: Radiochemistry (EPA Method GA-01-R)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD, or MS/DUP. (Soil/ Water.)		✓		
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Was a duplicate sample analyzed at the required frequency of 5% in this SDG?		✓		
Were all duplicate sample duplicate error ratios (DER) ≤ 1.42 ?			✓	
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%?	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?		✓		
Were tracer/carrier recoveries within the QC limits?			✓	
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) $< RL$?	✓			

LDC #: 31626G35
SDG #: —

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: MG
2nd Reviewer: CL

Validation Area	Yes	No	NA	Findings/Comments
D. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
X. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field duplicates.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
XI. Field blanks				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field blanks.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

VALIDATION FINDINGS WORKSHEET
Field Blanks**METHOD:** Radiochemistry (Method: see cover)Y N N/A Were field blanks identified in this SDG?Y N N/A Were target isotopes detected in the field blanks?**Blank units:** pCi/L **Associated sample units:** pCi/g**Sampling date:** 2/21/14 Soil factor applied 0.001x**Field blank type:** (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: all soil

Analyte	Blank ID	Sample Identification										
	5	Action Level	4									
Pa-234m	664	6.64	1.47/10.0U									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:

Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC #: 31626G35

SDG #: —

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page: 1 of 1

Reviewer: MG

2nd Reviewer: 2

METHOD: Radiochemistry (Method: GA-01-R)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recalculated using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$

Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R or RPD	%R or RPD	
LCS	Laboratory control sample	Co-60	41.32 (pCi/g)	41.7 (pCi/g)	99	99	Y
—	Matrix spike sample	—	—	—	—	—	—
—	Duplicate RPD	—	—	—	—	—	—
—	Chemical recovery	—	—	—	—	—	—

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

SDG #: _____

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: 1 of 1

Reviewer: MG

2nd reviewer:

METHOD: Radiochemistry (Method: GA-01-R)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Have results been reported and calculated correctly?

YN N/A Are results within the calibrated range of the instruments?

Analyte results for # 1, Th-234 reported with a positive detect were recalculated and verified using the following equation:

Activity =

Recalculation:

$$\frac{(\text{cpm} - \text{bckgrd cpm})}{(2.22)(E)(\text{Vol})(CF)}$$

$$\frac{(15.56 \text{ dps})(27.03 \text{ pCi/dps})}{884.8 \text{ g}} = 0.4753 \text{ pCi/g}$$

E = Efficiency

Vol = Volume

CF = %R, Self-absorbance, abundance, ect.

[illegible]

Note: _____

LDC #: 31626G36
 SDG #: 160-5703-1
 Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET Cat A/Cat B

Date: 4-18-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer: a

METHOD: Alpha Spectroscopy (Method A-01-R)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-21-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	not required
VI.	Laboratory control samples	A	LCS/LCSD
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	A	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks (< RL)	ND	FB = 5

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

1	CC-C-048-2-4 **	S	11		21		31	
2	CC-C-050-0-2		12		22		32	
3	LT-G-026-4-6		13		23		33	
4	LT-G-027-8-10		14		24		34	
5	2 FB028	W	15		25		35	
6			16		26		36	
7			17		27		37	
8			18		28		38	
9			19		29	1 PBS	39	
10			20		30	2 PBW	40	

Notes:

LDC #: 31626636
SDG #:

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: MG
2nd Reviewer:

Method: Radiochemistry (EPA Method A-01-R)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. Calibration				
Were all instruments and detectors calibration as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were NIST traceable standards used for all calibrations?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was the check source identified by activity and radionuclide?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
III. Blanks				
Were blank analyses performed as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. (Soil) (Water)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Was a duplicate sample analyzed at the required frequency of 5% in this SDG?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were all duplicate sample duplicate error ratios (DER) ≤ 1.42 ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were tracer/carrier recoveries within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the Minimum Detectable Activities (MDA) < RL?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

LDC #: 31626G36
SDG #: —

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: MG
2nd Reviewer: Q

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
X. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field duplicates.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
XI. Field blanks				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field blanks.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

LDC #: 31626G36

SDG #: —

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page: 1 of 1

Reviewer: MG

2nd Reviewer: OR

METHOD: Radiochemistry (Method: A-01-R)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recalculated using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$

Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R or RPD	%R or RPD	
LCS	Laboratory control sample	U-233/234	6.397 (pCi/g)	6.37 (pCi/g)	100	100	Y
—	Matrix spike sample	—	—	—	—	—	—
—	Duplicate RPD	—	—	—	—	—	—
1	Chemical recovery	Th-229	11.561 (dpm)	13.59 (dpm)	85.1	85.4	Y

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

SDG #: _____

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: 1 of 1

Reviewer: MG

2nd reviewer:

METHOD: Radiochemistry (Method: A-01-R)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Have results been reported and calculated correctly?

(Y) N N/A Are results within the calibrated range of the instruments?

Analyte results for # 1, TH-232 reported with a positive detect were recalculated and verified using the following equation:

Activity =

Recalculation:

$$\frac{\frac{(\text{cpm} - \text{bckgrd cpm})}{(2.22)(E)(\text{Vol})(CF)}}{(2.22)(0.2642)(1.00\text{g})(0.8544)} = 0.3173 \text{ pCi/g}$$

E = Efficiency

Vol = Volume

CF = %R, Self-absorbance, abundance, ect.

[illegible]

Note: _____

LDC #: 31626G29a
 SDG #: 160-5703-1
 Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET Cat A/Cat B

Date: 4-18-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer: [Signature]

METHOD: Radium 226 (EPA Method 903.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-21-14
II.	Initial calibration	N	Not reviewed for Cat A review.
III.	Calibration verification	N	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	A	DUP
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	N	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks	ND	FB = 1

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

Water

1	FB028	11		21		31	
2	FB028DUP	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBW	40	

Notes: _____

LDC #: 31626G29b
 SDG #: 160-5703-1
 Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET Cat A/Cat B

Date: 4-18-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer: [Signature]

METHOD: Radium 228 (EPA Method 904.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-21-14
II.	Initial calibration	N	Not reviewed for Cat A review.
III.	Calibration verification	N	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	not required
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	N	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks	ND	FB = 1

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

Water

1	FB028	11		21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBW	40	

Notes: _____

Site: Glen Isle
Laboratory: Test America St. Louis, MO
Report No.: 160-5766-1
Reviewer: Christina Rink and Mark Gregg/Laboratory Data Consultants for RXR
Glen Isle Partners, LLC
Date: April 19, 2014

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
LT-C-065-0-2**	160-5766-1	Gamma Spectroscopy**, Alpha Spectroscopy**
LT-C-066-0-2	160-5766-2	Gamma Spectroscopy, Alpha Spectroscopy
LT-C-067-10-12	160-5766-3	Gamma Spectroscopy, Alpha Spectroscopy
LT-C-064-8-10	160-5766-4	Gamma Spectroscopy, Alpha Spectroscopy
FB031	160-5766-5	Gamma Spectroscopy, Alpha Spectroscopy, Ra-226, Ra-228
CC-C-028-GW**	160-5766-6	Gamma Spectroscopy**, Alpha Spectroscopy, Ra-226**, Ra-228**
LT-C-054-GW**	160-5766-7	Gamma Spectroscopy, Alpha Spectroscopy**, Ra-226, Ra-228
DUP032	160-5766-8	Gamma Spectroscopy, Alpha Spectroscopy, Ra-226, Ra-228
FB004-GW	160-5766-9	Gamma Spectroscopy, Alpha Spectroscopy, Ra-226, Ra-228
LT-C-065-0-2DUP	160-5766-1DUP	Gamma Spectroscopy, Alpha Spectroscopy
FB004-GWDUP	160-5766-9DUP	Ra-228
FB031DUP	160-5766-5	Gamma Spectroscopy

Associated QC Samples(s):

Field Blanks: FB031, FB004-GW

Field Duplicate pair: CC-C-028-GW** and DUP032

The above-listed water and soil samples were collected on February 26, 2014 and were analyzed for gamma spectroscopy by method GA-01-R, alpha spectroscopy for isotopic thorium and isotopic uranium by method A-01-R, Radium-226 by EPA Method 903.0, and Radium-228 by EPA Method 904.0. The data validation was performed in accordance with the *Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual* (July 2004) and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, EPA 540-R-10-011* (January 2010), modified as necessary to accommodate the non-CLP methodologies used.

The radiometric data were evaluated based on the following parameters:

- Overall Evaluation of Data and Potential Usability Issues
- Data Completeness
- Holding Times
- Instrument Calibration
- Blank Analysis Results
- Chemical Recovery
- Laboratory Duplicate Results
- Field Duplicate Results
- Laboratory Control Sample (LCS) Results
- Detection Limits Results
- Sample Quantitation Results

Overall Evaluation of Data and Potential Usability Issues

All results are usable as reported or usable with minor qualification due to sample matrix or laboratory quality control outliers.

Samples indicated by a double asterisk on the front cover underwent Category B review. A Category A review was performed on all of the other samples. Calibration and raw data were not evaluated for the samples reviewed by Category A criteria since this review is based on QC data.

The validation findings were based on the following information.

Data Completeness

The data package was complete as defined under the requirements for the NYSDEC ASP category B laboratory deliverables.

Holding Times

All holding times were met.

Instrument Calibration

All criteria were met for samples on which a Category B review was performed. Calibration data were not evaluated for the samples reviewed by Category A criteria.

Blank Results

Gamma Spectroscopy

No isotopes were detected above the minimum detectable activity (MDA).

FB031 and FB004-GW were identified as field blanks. No analytes were detected above the reporting limits in the field blank samples.

Alpha Spectroscopy

Isotopes were detected above the minimum detectable activity (MDA). The presence of activity indicates that false positives may exist for these isotopes in the associated samples. Action Levels (ALs) were established at < RL. The following table summarizes the activities detected.

Blank ID	Isotope	Level Detected	Action Level	Associated Samples
PB (prep blank)	Thorium-230	0.1411 pCi/L	<RL	LT-C-054-GW**
PB (prep blank)	Thorium-230	0.06205 pCi/g	<RL	LT-C-065-0-2** LT-C-066-0-2 LT-C-067-10-12 LT-C-064-8-10

Sample results were qualified as follows:

- If sample concentration was < the reporting limit (RL) and \leq the Action Level, qualify the result as a nondetect (U) at the RL.
- If sample concentration was > the RL and \leq the Action Level, qualify the result as not detected (U) at the reported concentration.
- If the sample concentration was > the RL and > the Action Level, qualification of the data was not required.

Qualified sample results are listed in the table below.

Sample	Analyte	Reported Level	Validation Action
LT-C-065-0-2**	Thorium-230	0.510 pCi/g	1.00U pCi/g
LT-C-066-0-2	Thorium-230	0.660 pCi/g	1.00U pCi/g
LT-C-067-10-12	Thorium-230	0.290 pCi/g	1.00U pCi/g
LT-C-064-8-10	Thorium-230	0.385 pCi/g	1.00U pCi/g

These results can be used for project objectives as nondetect (U) which may have a minor impact on the data usability.

FB031 and FB004-GW were identified as field blanks. No analytes were detected above the reporting limits in the field blank samples.

Radium-226

No isotopes were detected above the minimum detectable activity (MDA).

FB031 and FB004-GW were identified as field blanks. No analytes were detected above the reporting limits in the field blank samples.

Radium-228

No isotopes were detected above the minimum detectable activity (MDA).

FB031 and FB004-GW were identified as field blanks. No analytes were detected above the reporting limits in the field blank samples.

Chemical Recovery

All criteria were met.

Laboratory Duplicate Results

The laboratory performed duplicate analysis on sample FB031 for gamma spectroscopy, LT-C-065-0-2** for gamma spectroscopy and alpha spectroscopy, and FB004-GWDUP for radium-226. All criteria were met.

Field Duplicate Results

Analytes were detected in the field duplicate samples. The following table summarizes the concentrations and validation actions taken.

Gamma Spectroscopy

Iostope	Concentration (pCi/L)		RPD (Limits)	Difference (Limits)	Validation Actions
	LT-C-065-0-2**	DUP032			
Actinium-228	25.9	11.1U	-	14.9 (≤ 50.0)	-
Potassium-40	100	76.5	-	23.5 (≤ 75.0)	-

--no action required

For water results > 5xRL and RPDs >50; estimate (J) results in the field duplicate pair.
For water results < 5xRL; the sample and duplicate results must be within 1XRL.

Alpha Spectroscopy

Iostope	Concentration (pCi/L)		RPD (Limits)	Difference (Limits)	Validation Actions
	LT-C-065-0-2	DUP032			
Uranium-233/234	0.156U	0.205	-	0.049 (≤ 1.00)	-
Uranium-238	0.0286U	0.307	-	0.2784 (≤ 1.00)	-

--no action required

For water results > 5xRL and RPDs >50; estimate (J) results in the field duplicate pair.
For water results < 5xRL; the sample and duplicate results must be within 1XRL.

Radium-226

Iostope	Concentration (pCi/L)		RPD (Limits)	Difference (Limits)	Validation Actions
	LT-C-065-0-2**	DUP032			
Radium-226	1.76	1.11	-	0.65 (≤ 1.00)	-

--no action required

For water results > 5xRL and RPDs >50; estimate (J) results in the field duplicate pair.

For water results < 5xRL; the sample and duplicate results must be within 1XRL.

Radium-228

Iostope	Concentration (pCi/L)		RPD (Limits)	Difference (Limits)	Validation Actions
	LT-C-065-0-2**	DUP032			
Radium-228	1.24	1.09	-	0.15 (≤ 1.00)	-

--no action required

For water results > 5xRL and RPDs >50; estimate (J) results in the field duplicate pair.

For water results < 5xRL; the sample and duplicate results must be within 1XRL.

LCS Results

Laboratory control samples were reviewed for each matrix as applicable. Analytes that did not meet the criteria are summarized in the following table.

LCS ID	Analyte	LCS %R	LCSD %R	RPD Limits	QC Limits	Associated Samples	Validation Actions
LCS/LCSD	Thorium-230	163	154	-	81-125	FB031 CC-C-028-GW DUP032 FB004-GW	None

Validation action was not required for thorium-230 due to high LCS/LCSD percent recovery as positive results only are affected and these compounds were not detected in the associated sample.

Detection Limits Results

All minimum detectable activities met required detection limits.

Sample Quantitation Results

Calculations were spot-checked; no discrepancies were noted.

DATA VALIDATION QUALIFIERS

- U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.
- J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.
- UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.
- R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

LDC #: 31626H35
 SDG #: 160-5766-1
 Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET Cat A/Cat B

Date: 4-18-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer: [Signature]

METHOD: Gamma Spectroscopy (Method GA-01-R)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-26-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	A	DUP
VI.	Laboratory control samples	A	LCS
VII.	Minimum detectable activity (MDA)	A	
VIII.	Sample result verification	A	Not reviewed for Cat A review.
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	D = 6 + 8
XI.	Field blanks (< RL)	ND	FB = 5, 9

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

1	LT-C-065-0-2 ** S	11	#5 DUP W	21		31	
2	LT-C-066-0-2	12		22		32	
3	LT-C-067-10-12	13		23		33	
4	LT-C-064-8-10	14		24		34	
5	FB031 W	15		25		35	
6	CC-C-028-GW **	16		26		36	
7	LT-C-054-GW	17		27		37	
8	DUP032	18		28		38	
9	FB004-GW	19		29	1 PBS	39	
10	LT-C-065-0-2DUP S	20		30	2 PBW	40	

Notes: _____

LDC #: 31626435
SDG #:

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: MG
2nd Reviewer: or

Method: Radiochemistry (EPA Method GA-01-R)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. <u>Soil</u> <u>Water</u> .		✓		
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Was a duplicate sample analyzed at the required frequency of 5% in this SDG?	✓			
Were all duplicate sample duplicate error ratios (DER) ≤ 1.42 ?	✓			
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%?	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?		✓		
Were tracer/carrier recoveries within the QC limits?			✓	
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) $< RL$?	✓			

LDC #: 31626435
SDG #: —

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: MG
2nd Reviewer: —

Validation Area	Yes	No	NA	Findings/Comments
D. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
E. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field duplicates.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
F. Field blanks				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field blanks.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

LDC#: 31626H35**VALIDATION FINDINGS WORKSHEET**
Field DuplicatesPage: 1 of 1Reviewer: MG2nd Reviewer: ✓**METHOD:** Radiochemistry (Method: GA-01-R)

Isotope	Activity (pCi/L)		(≤50) RPD	Difference	Limits	Qualify Parent Only
	6	8				
Ac-228	25.9	11.0U		14.9	(≤50.0)	
K-40	100	76.5		23.5	(≤75.0)	

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LDC #: 31626435
SDG #: —

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: MG
2nd Reviewer: 2

METHOD: Radiochemistry (Method: GA-01-R)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recalculated using the following formula:

$\%R = \frac{\text{Found}}{\text{True}} \times 100$ Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R or RPD	%R or RPD	
LCS	Laboratory control sample	Cs-137	33.70 (pCi/g)	35.7 (pCi/g)	94	94	Y
—	Matrix spike sample	—	—	—	—	—	—
10	Duplicate RPD	Pb-210	0.436 (pCi/g) ± 0.127	0.4963 (pCi/g) ± 0.130	RER 0.23	RER 0.24	Y
—	Chemical recovery	—	—	—	—	—	—

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31626H36
 SDG #: 160-5766-1
 Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET Cat A/Cat B

Date: 4-18-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer: CQ

METHOD: Alpha Spectroscopy (Method A-01-R)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-26-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	SW	
V.	Matrix Spike/(Matrix Spike) Duplicates	A	DUP
VI.	Laboratory control samples	SW	LCS/LCSD
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	A	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	SW	DUP = 6 + 8
XII.	Field blanks	ND	FB = 5, 9

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

1	1	LT-C-065-0-2	**	S	11		21		31	
2	1	LT-C-066-0-2			12		22		32	
3	1	LT-C-067-10-12			13		23		33	
4	1	LT-C-064-8-10		↓	14		24		34	
5	2	FB031		W	15		25		35	
6	2	CC-C-028-GW			16		26		36	
7	2	LT-C-054-GW	**		17		27		37	
8	2	DUP032			18		28		38	
9	2	FB004-GW		↓	19		29	1	PBS	39
10	1	LT-C-065-0-2DUP		S	20		30	2	PBW1	40

Notes: 3 PBW 2 (Th)

LDC #: 31626436
SDG #:

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: MG
2nd Reviewer: CR

Method: Radiochemistry (EPA Method A-01-R)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.	✓			
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD, or MS/DUP. (Soil) / (Water).		✓		
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Was a duplicate sample analyzed at the required frequency of 5% in this SDG?	✓			
Were all duplicate sample duplicate error ratios (DER) ≤ 1.42 ?	✓			
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%?		✓		
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	✓			
Were tracer/carrier recoveries within the QC limits?	✓			
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) < RL?	✓			

LDC #: 31626436
SDG #: —

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: MG
2nd Reviewer: OL

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
X. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field duplicates.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XI. Field blanks				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field blanks.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

VALIDATION FINDINGS WORKSHEET

Blanks

METHOD: Radiochemistry, Method A-01-R

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

☒ N N/A Were blank analyses performed as required? If no, please see qualifications below.☒ N N/A Were any activities in the blanks greater than the minimum detectable activity? If yes, please see qualifications below.

Conc. units: pCi/L

Associated Samples: 7 (>RL)

Isotope	Blank ID	Blank Action Limit	Sample Identification										
	PB		No Qual.										
Th-230	0.1411												

Conc. units: pCi/g

Associated Samples: all soil

Isotope	Blank ID	Blank Action Limit	Sample Identification										
	PB		1	2	3	4							
Th-230	0.06205		0.510/1.00U	0.660/1.00U	0.290/1.00U	0.385/1.00U							

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:

All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC#: 31626H36**VALIDATION FINDINGS WORKSHEET**
Field DuplicatesPage: 1 of 1
Reviewer: MG
2nd Reviewer: CL**METHOD:** Radiochemistry (Method: A-01-R)

Isotope	Activity (pCi/L)		(≤50) RPD	Difference	Limits	Qualify Parent Only
	6	8				
U-233/234	0.156U	0.205		0.049	(≤1.00)	
U-238	0.0286U	0.307		0.2784	(≤1.00)	

V:\FIELD DUPLICATES\FD_inorganic\31626H36.wpd

LDC #: 31626436
SDG #: —

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: MG
2nd Reviewer: OZ

METHOD: Radiochemistry (Method: A-01-R)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recalculated using the following formula:

$\%R = \frac{\text{Found}}{\text{True}} \times 100$ Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R or RPD	%R or RPD	
LCS	Laboratory control sample	Tn-230	24.41 (pci/g)	24.5 (pci/g)	100	100	Y
—	Matrix spike sample	—	—	—	—	—	—
10	Duplicate RPD	Tn-232	0.556 (pci/g) ± 0.164	0.3827 (pci/g) ± 0.129	RER 0.59	RER 0.59	Y
1	Chemical recovery	U-232	13.763 (dpm)	16.45 (dpm)	83.7	85.7	↓

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31626H29a
 SDG #: 160-5766-1
 Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET Cat A/Cat B

Date: 4-18-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer:

METHOD: Radium 226 (EPA Method 903.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-26-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	A	DUP
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	A	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	SW	DUP = 2 + 4
XII.	Field blanks	ND	FB = 1, 5

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

all water

1	FB031	11		21		31	
2	CC-C-028-GW **	12		22		32	
3	LT-C-054-GW	13		23		33	
4	DUP032	14		24		34	
5	FB004-GW	15		25		35	
6	FB004-GWDUP	16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBW	40	

Notes: No ingrowth

LDC #: 31626H29a
SDG #:

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: MG
2nd Reviewer: ca

Method: Radiochemistry(EPA Method 903.0)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. Calibration				
Were all instruments and detectors calibration as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were NIST traceable standards used for all calibrations?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was the check source identified by activity and radionuclide?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
III. Blanks				
Were blank analyses performed as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / <u>Water</u> .	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Was a duplicate sample analyzed at the required frequency of 5% in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all duplicate sample duplicate error ratios (DER) ≤ 1.42 ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were tracer/carrier recoveries within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the Minimum Detectable Activities (MDA) $< RL$?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

LDC #: 31626H29a
SDG #: —

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: MG
2nd Reviewer: a

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
X. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field duplicates.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XI. Field blanks				
Field blanks were identified in this SDG.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field blanks.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

LDC#: 31626H29a

VALIDATION FINDINGS WORKSHEET

Field DuplicatesPage: 1 of 1Reviewer: MG2nd Reviewer: CN**METHOD:** Radiochemistry (Method: 903.0)

Isotope	Activity (pCi/L)		(≤50) RPD	Difference	Limits	Qualify Parent Only
	2	4				
Ra-226	1.76	1.11		0.65	(≤1.00)	

V:\FIELD DUPLICATES\FD_inorganic\31626H29a.wpd

LDC #: 31626H29a

SDG #: —

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page: 1 of 1

Reviewer: MG

2nd Reviewer: —

METHOD: Radiochemistry (Method: 903.0)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recalculated using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$

Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R or RPD	%R or RPD	
LCS	Laboratory control sample	Ra-226	10.65 (pCi/L)	11.2 (pCi/L)	95	95	Y
—	Matrix spike sample	—	—	—	—	—	—
6	Duplicate RPD	Ra-226	0.01994 (pCi/L) ± 0.119	0.12284 (pCi/L) ± 0.122	RER 0.43	RER 0.43	Y
2	Chemical recovery	Ba	0.0266 (g)	0.0339 (g)	78.5	78.5	↓

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

SDG #: 1

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: 1 of 1

Reviewer: MG

2nd reviewer:

METHOD: Radiochemistry (Method: 903.0)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Have results been reported and calculated correctly?

Are results within the calibrated range of the instruments?

Analyte results for #2, Ra-226 reported with a positive detect were recalculated and verified using the following equation:

Activity = ing. \rightarrow mid count = 8.3 hr Recalculation:

$$\frac{(\text{cpm} - \text{bckgrd cpm})}{(2.22)(E)(\text{Vol})(CF)} \left(\frac{139}{200} \right) - \left(\frac{76}{1000} \right) = 1.763 \text{ pCi/L}$$

E = Efficiency

Vol = Volume

CF = %R, Self-absorbance, abundance, ect.

[illegible]

Note: _____

LDC #: 31626H29b
 SDG #: 160-5766-1
 Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET Cat A/Cat B

Date: 4-18-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer: [Signature]

METHOD: Radium 228 (EPA Method 904.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-26-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	not required
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	A	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	SW	D = 2 + 4
XII.	Field blanks	ND	FB = 1, 5

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

all water

1	FB031	11		21		31	
2	CC-C-028-GW **	12		22		32	
3	LT-C-054-GW	13		23		33	
4	DUP032	14		24		34	
5	FB004-GW	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBW	40	

Notes: _____

LDC #: 316264296
SDG #:

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: MG
2nd Reviewer:

Method: Radiochemistry(EPA Method 904.0)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / <u>Water</u> .		✓		
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Was a duplicate sample analyzed at the required frequency of 5% in this SDG?		✓		
Were all duplicate sample duplicate error ratios (DER) ≤ 1.427 .			✓	
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	✓			
Were tracer/carrier recoveries within the QC limits?	✓			
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) < RL?	✓			

LDC #: 31626H296
SDG #: —

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: MG
2nd Reviewer: —

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
X. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field duplicates.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XI. Field blanks				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field blanks.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

LDC#: 31626H29b**VALIDATION FINDINGS WORKSHEET**
Field DuplicatesPage: 1 of 1
Reviewer: MG
2nd Reviewer: [Signature]**METHOD:** Radiochemistry (Method: 904.0)

Isotope	Activity (pCi/L)		(≤50) RPD	Difference	Limits	Qualify Parent Only
	2	4				
Ra-228	1.24	1.09		0.15	(≤1.00)	

V:\FIELD DUPLICATES\FD_inorganic\31626H29b.wpd

LDC #: 31626H296

SDG #: —

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page: 1 of 1

Reviewer: MG

2nd Reviewer:

METHOD: Radiochemistry (Method: 904.0)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recalculated using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$

Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R or RPD	%R or RPD	
LCS	Laboratory control sample	Ra-228	3.691 (pCi/L)	3.95 (pCi/L)	93	93	Y
—	Matrix spike sample	—	—	—	—	—	—
—	Duplicate RPD	—	—	—	—	—	—
2	Chemical recovery	Ba	0.0283 (g)	0.0339 (g)	83.5	83.5	Y
		Y	0.0223 (g)	0.0249 (g)	89.6	89.6	

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

Site: Glen Isle
Laboratory: Test America St. Louis, MO
Report No.: 160-5766-2
Reviewer: Christina Rink and Mark Gregg/Laboratory Data Consultants for RXR
Glen Isle Partners, LLC
Date: April 21, 2014

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
LT-C-054-GW**	160-5766-7	Ra-226

Associated QC Samples(s):

Field Blanks: FB004-GW (from SDG 160-5766-1)

Field Duplicate pair: None Associated

The above-listed water and soil samples were collected on February 26, 2014 and were analyzed for Radium-226 by EPA Method 903.0 with a 21 day ingrowth. The data validation was performed in accordance with the *Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual* (July 2004) and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, EPA 540-R-10-011* (January 2010), modified as necessary to accommodate the non-CLP methodologies used.

The radiometric data were evaluated based on the following parameters:

- Overall Evaluation of Data and Potential Usability Issues
- Data Completeness
- Holding Times
- Instrument Calibration
- Blank Analysis Results
- Chemical Recovery
- Laboratory Duplicate Results
- Field Duplicate Results
- Laboratory Control Sample (LCS) Results
- Detection Limits Results
- Sample Quantitation Results

Overall Evaluation of Data and Potential Usability Issues

All results are usable as reported.

Samples indicated by a double asterisk on the front cover underwent Category B review. A Category A review was performed on all of the other samples. Calibration and raw data were not evaluated for the samples reviewed by Category A criteria since this review is based on QC data.

The validation findings were based on the following information.

Data Completeness

The data package was complete as defined under the requirements for the NYSDEC ASP category B laboratory deliverables.

Holding Times

All holding times were met.

Instrument Calibration

All criteria were met for samples on which a Category B review was performed. Calibration data were not evaluated for the samples reviewed by Category A criteria.

Blank Results

No isotopes were detected above the minimum detectable activity (MDA).

FB004-GW (from SDG 160-5766-1) was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Chemical Recovery

All criteria were met.

Laboratory Duplicate Results

Laboratory duplicates were not associated with this sample set. Validation action was not required on this basis.

Field Duplicate Results

A field duplicate pair was not associated with this sample set. Validation action was not required on this basis.

LCS Results

All criteria were met.

Detection Limits Results

All minimum detectable activities met required detection limits.

Sample Quantitation Results

Calculations were spot-checked; no discrepancies were noted.

DATA VALIDATION QUALIFIERS

- U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.
- J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified “J” data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The ‘J’ data may be biased high or low or the direction of the bias may be indeterminable.
- UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified “UJ” data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The ‘UJ’ data may be biased low.
- R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

LDC #: 31626129a
 SDG #: 160-5766-2
 Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET Cat A/Cat B

Date: 4-18-14
 Page: 1 of 1
 Reviewer: MG
 2nd Reviewer: CL

METHOD: Radium 226 (EPA Method 903.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-26-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	not required
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	A	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks	ND	FB = FB004 - GW

SDG: 160-5766-1

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

Water

1	LT-C-054-GW **	11		21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBW	40	

Notes: 21 day ingrowth

LDC #: 31626I29a
SDG #:

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: MG
2nd Reviewer: OL

Method: Radiochemistry (EPA Method 903.0)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD, or MS/DUP. Soil / <u>Water</u>		✓		
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Was a duplicate sample analyzed at the required frequency of 5% in this SDG?		✓		
Were all duplicate sample duplicate error ratios (DER) ≤ 1.427 .			✓	
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	✓			
Were tracer/carrier recoveries within the QC limits?	✓			
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) < RL?	✓			

LDC #: 31626I29a
SDG #: —

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: MG
2nd Reviewer: al

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XI. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.		✓		

LDC #: 31626I29a
SDG #: _____

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: MG
2nd Reviewer: CR

METHOD: Radiochemistry (Method: 903.0)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recalculated using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$
 Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$
 Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R or RPD	%R or RPD	
LCS	Laboratory control sample	Ra-226	12.92 (pCi/L)	11.2 (pCi/L)	115	115	Y
—	Matrix spike sample	—	—	—	—	—	—
—	Duplicate RPD	—	—	—	—	—	—
1	Chemical recovery	Ba	0.0238 (g)	0.0339 (g)	70.2	70.2	Y

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31626I29a


SDG #: 1

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: 1 of 1

Reviewer: MG

2nd reviewer: 

METHOD: Radiochemistry (Method: 903.0)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

☒ N N/A Have results been reported and calculated correctly?

(Y) N N/A Are results within the calibrated range of the instruments?

Analyte results for # 1, Ra-226 reported with a positive detect were recalculated and verified using the following equation:

Activity = ing \rightarrow mid count = 1162hr Recalculation:

$$\frac{(\text{cpm} - \text{bckgrd cpm})}{(2.22)(E)(\text{Vol})(CF)} \left(\frac{251}{200} \right) - \left(\frac{62}{1000} \right) = 4.746 \text{ pCi/L}$$

E = Efficiency

Vol = Volume

CF = %R, Self-absorbance, abundance, ect.

[illegible]

Note: _____

Glen Isle - LDC# 31626

SDG: 16055191

Analytical Method		A-01-R										
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601052021A	1601052021A	THORIUM-228	2/19/2014	0.09496	Yes	Y				0.0712	0.0712	pci/l
1601052021A	1601052021A	THORIUM-230	2/19/2014	0.04305	Yes	Y	U		U	0.108	0.108	pci/l
1601052021A	1601052021A	THORIUM	2/19/2014	0	Yes	Y	U		U	0.0709	0.0709	pci/l
1601052031A	1601052031A	URANIUM-235	2/19/2014	0	Yes	Y	U		U	0.0833	0.0833	pci/l
1601052031A	1601052031A	URANIUM 233 AND 234	2/19/2014	-0.004185	Yes	Y	U		U	0.102	0.102	pci/l
1601052031A	1601052031A	URANIUM	2/19/2014	0	Yes	Y	U		U	0.0668	0.0668	pci/l
1601057521A	1601057521A	THORIUM-230	2/20/2014	0.05139	Yes	Y	U		U	0.0659	0.0659	pci/g
1601057521A	1601057521A	THORIUM	2/20/2014	0	Yes	Y	U		U	0.0346	0.0346	pci/g
1601057521A	1601057521A	THORIUM-228	2/20/2014	-0.003617	Yes	Y	U		U	0.0823	0.0823	pci/g
1601057531A	1601057531A	URANIUM	2/20/2014	-0.006328	Yes	Y	U		U	0.0640	0.0640	pci/g
1601057531A	1601057531A	URANIUM 233 AND 234	2/20/2014	0.005636	Yes	Y	U		U	0.0833	0.0833	pci/g
1601057531A	1601057531A	URANIUM-235	2/20/2014	0.02543	Yes	Y	U		U	0.0639	0.0639	pci/g
FB018-20140206	160-5519-1	THORIUM	2/19/2014	-0.00582	Yes	Y	U		U	0.104	0.104	pci/l
FB018-20140206	160-5519-1	THORIUM-230	2/19/2014	0.168	Yes	Y				0.0973	0.0973	pci/l
FB018-20140206	160-5519-1	THORIUM-228	2/19/2014	-0.00134	Yes	Y	U		U	0.174	0.174	pci/l
FB018-20140206	160-5519-1	URANIUM	2/19/2014	0.0306	Yes	Y	U		U	0.121	0.121	pci/l
FB018-20140206	160-5519-1	URANIUM 233 AND 234	2/19/2014	-0.00667	Yes	Y	U		U	0.152	0.152	pci/l
FB018-20140206	160-5519-1	URANIUM-235	2/19/2014	0.0216	Yes	Y	U		U	0.121	0.121	pci/l
FB018-20140206LR	160-5519-1LR	THORIUM	2/19/2014	0	Yes	Y	U		U	0.0719	0.0719	pci/l
FB018-20140206LR	160-5519-1LR	THORIUM-228	2/19/2014	0.0271	Yes	Y	U		U	0.191	0.191	pci/l
FB018-20140206LR	160-5519-1LR	THORIUM-230	2/19/2014	0.1695	Yes	Y				0.156	0.156	pci/l
FB018-20140206LR	160-5519-1LR	URANIUM	2/19/2014	0.06195	Yes	Y	U		U	0.100	0.100	pci/l
FB018-20140206LR	160-5519-1LR	URANIUM 233 AND 234	2/19/2014	0.009656	Yes	Y	U		U	0.126	0.126	pci/l

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Analytical Method A-01-R

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
FB018-20140206LR	160-5519-1LR	URANIUM-235	2/19/2014	-0.0103	Yes	Y	U		U	0.143	0.143	pci/l
LT-C-045-4-6-20140206	160-5519-2	THORIUM	2/20/2014	0.348	Yes	Y				0.0609	0.0609	pci/g
LT-C-045-4-6-20140206	160-5519-2	THORIUM-228	2/20/2014	0.393	Yes	Y				0.115	0.115	pci/g
LT-C-045-4-6-20140206	160-5519-2	THORIUM-230	2/20/2014	0.402	Yes	Y				0.0763	0.0763	pci/g
LT-C-045-4-6-20140206	160-5519-2	URANIUM-235	2/20/2014	-0.00347	Yes	Y	U	UJ	UJ	0.0843	0.0843	pci/g
LT-C-045-4-6-20140206	160-5519-2	URANIUM	2/20/2014	0.217	Yes	Y				0.0772	0.0772	pci/g
LT-C-045-4-6-20140206	160-5519-2	URANIUM 233 AND 234	2/20/2014	0.328	Yes	Y				0.0963	0.0963	pci/g
LT-C-045-4-6-20140206LR	160-5519-2LR	THORIUM	2/20/2014	0.3912	Yes	Y				0.0560	0.0560	pci/g
LT-C-045-4-6-20140206LR	160-5519-2LR	THORIUM-228	2/20/2014	0.3343	Yes	Y				0.0799	0.0799	pci/g
LT-C-045-4-6-20140206LR	160-5519-2LR	THORIUM-230	2/20/2014	0.4063	Yes	Y				0.0563	0.0563	pci/g
LT-C-045-4-6-20140206LR	160-5519-2LR	URANIUM 233 AND 234	2/20/2014	0.3131	Yes	Y				0.110	0.110	pci/g
LT-C-045-4-6-20140206LR	160-5519-2LR	URANIUM	2/20/2014	0.3133	Yes	Y				0.0661	0.0661	pci/g
LT-C-045-4-6-20140206LR	160-5519-2LR	URANIUM-235	2/20/2014	0.07635	Yes	Y				0.0722	0.0722	pci/g

Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601051411A	1601051411A	BISMUTH-214	2/18/2014	0.896	Yes	Y	U		U	11.6	11.6	pci/l
1601051411A	1601051411A	ACTINIUM 228	2/18/2014	2.565	Yes	Y	U		U	17.7	17.7	pci/l
1601051411A	1601051411A	BISMUTH-212	2/18/2014	7.113	Yes	Y	U		U	55.7	55.7	pci/l
1601051411A	1601051411A	COBALT-60	2/18/2014	0.6924	Yes	Y	U		U	5.66	5.66	pci/l
1601051411A	1601051411A	LEAD-212	2/18/2014	1.188	Yes	Y	U		U	6.44	6.44	pci/l
1601051411A	1601051411A	LEAD-214	2/18/2014	4.876	Yes	Y	U		U	8.66	8.66	pci/l
1601051411A	1601051411A	POTASSIUM-40	2/18/2014	-95.66	Yes	Y	U		U	94.3	94.3	pci/l
1601051411A	1601051411A	AMERICIUM-241	2/18/2014	1.369	Yes	Y	U		U	6.18	6.18	pci/l
1601051411A	1601051411A	Protactinium 234	2/18/2014	-144.9	Yes	Y	U		U	725	725	pci/l

Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601051411A	1601051411A	CESIUM-137	2/18/2014	0.562	Yes	Y	U		U	4.51	4.51	pci/l
1601051411A	1601051411A	PROTACTINIUM 231	2/18/2014	7.26	Yes	Y	U		U	115	115	pci/l
1601057991A	1601057991A	RADIUM-228	2/20/2014	0.02469	Yes	Y				0.00945	0.00945	pci/g
1601057991A	1601057991A	LEAD-214	2/20/2014	0.0003649	Yes	Y	U		U	0.00903	0.00903	pci/g
1601057991A	1601057991A	POTASSIUM-40	2/20/2014	-0.03604	Yes	Y	U		U	0.0745	0.0745	pci/g
1601057991A	1601057991A	PROTACTINIUM 231	2/20/2014	0.01771	Yes	Y	U		U	0.0956	0.0956	pci/g
1601057991A	1601057991A	ACTINIUM 228	2/20/2014	0.02469	Yes	Y				0.00945	0.00945	pci/g
1601057991A	1601057991A	RADIUM-226	2/20/2014	-0.03531	Yes	Y	U		U	0.0856	0.0856	pci/g
1601057991A	1601057991A	THALLIUM-208	2/20/2014	0.002583	Yes	Y	U		U	0.00386	0.00386	pci/g
1601057991A	1601057991A	THORIUM-234	2/20/2014	0.01129	Yes	Y	U		U	0.0661	0.0661	pci/g
1601057991A	1601057991A	Protactinium 234	2/20/2014	0.3226	Yes	Y	U		U	0.386	0.386	pci/g
1601057991A	1601057991A	LEAD-212	2/20/2014	0.003412	Yes	Y	U		U	0.00645	0.00645	pci/g
1601057991A	1601057991A	AMERICIUM-241	2/20/2014	0.001095	Yes	Y	U		U	0.00651	0.00651	pci/g
1601057991A	1601057991A	BISMUTH-212	2/20/2014	-0.01226	Yes	Y	U		U	0.0526	0.0526	pci/g
1601057991A	1601057991A	BISMUTH-214	2/20/2014	-0.002125	Yes	Y	U		U	0.0105	0.0105	pci/g
1601057991A	1601057991A	CESIUM-137	2/20/2014	0.0006169	Yes	Y	U		U	0.00379	0.00379	pci/g
1601057991A	1601057991A	COBALT-60	2/20/2014	0.0004309	Yes	Y	U		U	0.00425	0.00425	pci/g
1601057991A	1601057991A	URANIUM-235	2/20/2014	0.01202	Yes	Y	U		U	0.0145	0.0145	pci/g
1601057991A	1601057991A	URANIUM	2/20/2014	0.01129	Yes	Y	U		U	0.0661	0.0661	pci/g
1601057991A	1601057991A	LEAD-210	2/20/2014	0.03067	Yes	Y	U		U	0.0896	0.0896	pci/g
FB018-20140206	160-5519-1	PROTACTINIUM 231	2/16/2014	8.47	Yes	Y	U		U	119	119	pci/l
FB018-20140206	160-5519-1	BISMUTH-214	2/16/2014	4.5	Yes	Y	U		U	8.62	8.62	pci/l
FB018-20140206	160-5519-1	BISMUTH-212	2/16/2014	14.9	Yes	Y	U		U	45.1	45.1	pci/l
FB018-20140206	160-5519-1	CESIUM-137	2/16/2014	1.11	Yes	Y	U		U	3.48	3.48	pci/l
FB018-20140206	160-5519-1	LEAD-212	2/16/2014	-0.64	Yes	Y	U		U	6.98	6.98	pci/l

Analytical Method		E901.1										
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
FB018-20140206	160-5519-1	LEAD-214	2/16/2014	1.31	Yes	Y	U		U	7.59	7.59	pci/l
FB018-20140206	160-5519-1	POTASSIUM-40	2/16/2014	40.9	Yes	Y	U		U	53.2	53.2	pci/l
FB018-20140206	160-5519-1	Protactinium 234	2/16/2014	-352	Yes	Y	U		U	626	626	pci/l
FB018-20140206	160-5519-1	ACTINIUM 228	2/16/2014	9.17	Yes	Y	U		U	13.3	13.3	pci/l
FB018-20140206LR	160-5519-1LR	ACTINIUM 228	2/18/2014	14.25	Yes	Y				13.0	13.0	pci/l
FB018-20140206LR	160-5519-1LR	BISMUTH-212	2/18/2014	-6.769	Yes	Y	U		U	54.3	54.3	pci/l
FB018-20140206LR	160-5519-1LR	AMERICIUM-241	2/18/2014	4.292	Yes	Y	U		U	5.19	5.19	pci/l
FB018-20140206LR	160-5519-1LR	BISMUTH-214	2/18/2014	-1.543	Yes	Y	U		U	12.3	12.3	pci/l
FB018-20140206LR	160-5519-1LR	CESIUM-137	2/18/2014	0.04988	Yes	Y	U		U	4.58	4.58	pci/l
FB018-20140206LR	160-5519-1LR	COBALT-60	2/18/2014	-0.5534	Yes	Y	U		U	4.59	4.59	pci/l
FB018-20140206LR	160-5519-1LR	LEAD-212	2/18/2014	1.503	Yes	Y	U		U	7.72	7.72	pci/l
FB018-20140206LR	160-5519-1LR	LEAD-214	2/18/2014	1.373	Yes	Y	U		U	9.61	9.61	pci/l
FB018-20140206LR	160-5519-1LR	POTASSIUM-40	2/18/2014	-21.69	Yes	Y	U		U	77.2	77.2	pci/l
FB018-20140206LR	160-5519-1LR	PROTACTINIUM 231	2/18/2014	3.246	Yes	Y	U		U	113	113	pci/l
FB018-20140206LR	160-5519-1LR	Protactinium 234	2/18/2014	166.8	Yes	Y	U		U	509	509	pci/l
LT-C-045-4-6-20140206	160-5519-2	BISMUTH-212	2/20/2014	0.58	Yes	Y				0.0962	0.0962	pci/g
LT-C-045-4-6-20140206	160-5519-2	LEAD-212	2/20/2014	0.51	Yes	Y				0.0129	0.0129	pci/g
LT-C-045-4-6-20140206	160-5519-2	LEAD-210	2/20/2014	0.419	Yes	Y				0.165	0.165	pci/g
LT-C-045-4-6-20140206	160-5519-2	BISMUTH-214	2/20/2014	0.405	Yes	Y				0.0165	0.0165	pci/g
LT-C-045-4-6-20140206	160-5519-2	URANIUM-235	2/20/2014	0.0321	Yes	Y	U		U	0.0492	0.0492	pci/g
LT-C-045-4-6-20140206	160-5519-2	LEAD-214	2/20/2014	0.471	Yes	Y				0.0151	0.0151	pci/g
LT-C-045-4-6-20140206	160-5519-2	POTASSIUM-40	2/20/2014	8.43	Yes	Y				0.0894	0.0894	pci/g
LT-C-045-4-6-20140206	160-5519-2	PROTACTINIUM 231	2/20/2014	-0.181	Yes	Y	U		U	0.250	0.250	pci/g
LT-C-045-4-6-20140206	160-5519-2	Protactinium 234	2/20/2014	0.938	Yes	Y				0.930	0.930	pci/g
LT-C-045-4-6-20140206	160-5519-2	RADIUM-226	2/20/2014	0.99	Yes	Y				0.166	0.166	pci/g

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Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-C-045-4-6-20140206	160-5519-2	RADIUM-228	2/20/2014	0.52	Yes	Y				0.0331	0.0331	pci/g
LT-C-045-4-6-20140206	160-5519-2	THALLIUM-208	2/20/2014	0.173	Yes	Y				0.00893	0.00893	pci/g
LT-C-045-4-6-20140206	160-5519-2	THORIUM-234	2/20/2014	0.496	Yes	Y				0.178	0.178	pci/g
LT-C-045-4-6-20140206	160-5519-2	URANIUM	2/20/2014	0.496	Yes	Y				0.178	0.178	pci/g
LT-C-045-4-6-20140206	160-5519-2	ACTINIUM 228	2/20/2014	0.52	Yes	Y				0.0331	0.0331	pci/g
LT-C-045-4-6-20140206LR	160-5519-2LR	ACTINIUM 228	2/20/2014	0.4434	Yes	Y				0.0175	0.0175	pci/g
LT-C-045-4-6-20140206LR	160-5519-2LR	AMERICIUM-241	2/20/2014	0.002343	Yes	Y	U		U	0.0166	0.0166	pci/g
LT-C-045-4-6-20140206LR	160-5519-2LR	BISMUTH-212	2/20/2014	0.4787	Yes	Y				0.0649	0.0649	pci/g
LT-C-045-4-6-20140206LR	160-5519-2LR	BISMUTH-214	2/20/2014	0.3916	Yes	Y				0.0138	0.0138	pci/g
LT-C-045-4-6-20140206LR	160-5519-2LR	CESIUM-137	2/20/2014	-0.003244	Yes	Y	U		U	0.00693	0.00693	pci/g
LT-C-045-4-6-20140206LR	160-5519-2LR	COBALT-60	2/20/2014	0.002878	Yes	Y	U		U	0.00606	0.00606	pci/g
LT-C-045-4-6-20140206LR	160-5519-2LR	LEAD-210	2/20/2014	0.4204	Yes	Y				0.129	0.129	pci/g
LT-C-045-4-6-20140206LR	160-5519-2LR	LEAD-212	2/20/2014	0.4913	Yes	Y				0.00955	0.00955	pci/g
LT-C-045-4-6-20140206LR	160-5519-2LR	RADIUM-226	2/20/2014	0.9103	Yes	Y				0.136	0.136	pci/g
LT-C-045-4-6-20140206LR	160-5519-2LR	URANIUM	2/20/2014	0.4088	Yes	Y				0.141	0.141	pci/g
LT-C-045-4-6-20140206LR	160-5519-2LR	POTASSIUM-40	2/20/2014	8.365	Yes	Y				0.0648	0.0648	pci/g
LT-C-045-4-6-20140206LR	160-5519-2LR	Protactinium 234	2/20/2014	0.8928	Yes	Y				0.679	0.679	pci/g
LT-C-045-4-6-20140206LR	160-5519-2LR	RADIUM-228	2/20/2014	0.4434	Yes	Y				0.0175	0.0175	pci/g
LT-C-045-4-6-20140206LR	160-5519-2LR	THALLIUM-208	2/20/2014	0.1457	Yes	Y				0.00613	0.00613	pci/g
LT-C-045-4-6-20140206LR	160-5519-2LR	THORIUM-234	2/20/2014	0.4088	Yes	Y				0.141	0.141	pci/g
LT-C-045-4-6-20140206LR	160-5519-2LR	URANIUM-235	2/20/2014	0.06749	Yes	Y				0.0339	0.0339	pci/g
LT-C-045-4-6-20140206LR	160-5519-2LR	LEAD-214	2/20/2014	0.4388	Yes	Y				0.0124	0.0124	pci/g
LT-C-045-4-6-20140206LR	160-5519-2LR	PROTACTINIUM 231	2/20/2014	-0.1951	Yes	Y	U		U	0.173	0.173	pci/g

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Analytical Method		E903.0										
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601051301A	1601051301A	RADIUM-226	2/14/2014	0.2304	Yes	Y				0.187	0.187	pci/l
FB018-20140206	160-5519-1	RADIUM-226	2/14/2014	-0.0724	Yes	Y	U		U	0.256	0.256	pci/l

Analytical Method		E904.0										
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601051321A	1601051321A	RADIUM-228	2/17/2014	-0.005738	Yes	Y	U		U	0.367	0.367	pci/l
FB018-20140206	160-5519-1	RADIUM-228	2/17/2014	-0.202	Yes	Y	U		U	0.364	0.364	pci/l

Analytical Method		A-01-R										
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601066741A	1601066741A	THORIUM	2/25/2014	-0.004241	Yes	Y	U		U	0.0833	0.0833	pci/g
1601066741A	1601066741A	THORIUM-228	2/25/2014	0.06218	Yes	Y	U		U	0.0856	0.0856	pci/g
1601066741A	1601066741A	THORIUM-230	2/25/2014	0.1046	Yes	Y				0.0738	0.0738	pci/g
1601066801A	1601066801A	URANIUM	2/25/2014	-0.01895	Yes	Y	U		U	0.0989	0.0989	pci/g
1601066801A	1601066801A	URANIUM 233 AND 234	2/25/2014	0.006125	Yes	Y	U		U	0.0939	0.0939	pci/g
1601066801A	1601066801A	URANIUM-235	2/25/2014	-0.01753	Yes	Y	U		U	0.105	0.105	pci/g
1601069581A	1601069581A	THORIUM-230	2/28/2014	0.1642	Yes	Y	U		U	0.264	0.264	pci/l
1601069581A	1601069581A	THORIUM	2/28/2014	0.001747	Yes	Y	U		U	0.181	0.181	pci/l
1601069581A	1601069581A	THORIUM-228	2/28/2014	-0.001755	Yes	Y	U		U	0.229	0.229	pci/l
1601069591A	1601069591A	URANIUM 233 AND 234	2/27/2014	0.01351	Yes	Y	U		U	0.112	0.112	pci/l
1601069591A	1601069591A	URANIUM-235	2/27/2014	-0.005043	Yes	Y	U		U	0.122	0.122	pci/l
1601069591A	1601069591A	URANIUM	2/27/2014	0.06067	Yes	Y	U		U	0.0982	0.0982	pci/l
CC-C-013-4-6-20140212	160-5606-1	URANIUM-235	2/25/2014	0.0607	Yes	Y	U		U	0.0724	0.0724	pci/g
CC-C-013-4-6-20140212	160-5606-1	URANIUM 233 AND 234	2/25/2014	0.485	Yes	Y				0.104	0.104	pci/g
CC-C-013-4-6-20140212	160-5606-1	URANIUM	2/25/2014	0.491	Yes	Y				0.0726	0.0726	pci/g
CC-C-013-4-6-20140212	160-5606-1	THORIUM-228	2/25/2014	0.563	Yes	Y				0.0648	0.0648	pci/g
CC-C-013-4-6-20140212	160-5606-1	THORIUM-230	2/25/2014	0.463	Yes	Y		U	U	0.0592	0.0592	pci/g
CC-C-013-4-6-20140212	160-5606-1	THORIUM	2/25/2014	0.374	Yes	Y				0.0639	0.0639	pci/g
CC-C-013-4-6-20140212LR	160-5606-1LR	URANIUM-235	2/25/2014	0.04499	Yes	Y	U		U	0.0951	0.0951	pci/g
CC-C-013-4-6-20140212LR	160-5606-1LR	URANIUM 233 AND 234	2/25/2014	0.3778	Yes	Y				0.139	0.139	pci/g
CC-C-013-4-6-20140212LR	160-5606-1LR	URANIUM	2/25/2014	0.405	Yes	Y				0.104	0.104	pci/g
CC-C-013-4-6-20140212LR	160-5606-1LR	THORIUM	2/25/2014	0.4114	Yes	Y				0.0600	0.0600	pci/g
CC-C-013-4-6-20140212LR	160-5606-1LR	THORIUM-228	2/25/2014	0.5813	Yes	Y				0.105	0.105	pci/g
CC-C-013-4-6-20140212LR	160-5606-1LR	THORIUM-230	2/25/2014	0.6964	Yes	Y				0.0751	0.0751	pci/g
CC-C-33-4-6-20140214	160-5606-3	URANIUM 233 AND 234	2/25/2014	1.03	Yes	Y				0.0957	0.0957	pci/g

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
CC-C-33-4-6-20140214	160-5606-3	URANIUM-235	2/25/2014	0.134	Yes	Y				0.0808	0.0808	pci/g
CC-C-33-4-6-20140214	160-5606-3	URANIUM	2/25/2014	1.01	Yes	Y				0.0762	0.0762	pci/g
CC-C-33-4-6-20140214	160-5606-3	THORIUM-228	2/25/2014	0.736	Yes	Y				0.0786	0.0786	pci/g
CC-C-33-4-6-20140214	160-5606-3	THORIUM-230	2/25/2014	1.28	Yes	Y				0.0656	0.0656	pci/g
CC-C-33-4-6-20140214	160-5606-3	THORIUM	2/25/2014	0.724	Yes	Y				0.0596	0.0596	pci/g
CC-C-36-4-6-20140214	160-5606-4	URANIUM-235	2/25/2014	0.00696	Yes	Y	U		U	0.0905	0.0905	pci/g
CC-C-36-4-6-20140214	160-5606-4	URANIUM 233 AND 234	2/25/2014	0.541	Yes	Y				0.0979	0.0979	pci/g
CC-C-36-4-6-20140214	160-5606-4	URANIUM	2/25/2014	0.416	Yes	Y				0.0663	0.0663	pci/g
CC-C-36-4-6-20140214	160-5606-4	THORIUM-230	2/25/2014	0.542	Yes	Y		U	U	0.0797	0.0797	pci/g
CC-C-36-4-6-20140214	160-5606-4	THORIUM-228	2/25/2014	0.418	Yes	Y				0.136	0.136	pci/g
CC-C-36-4-6-20140214	160-5606-4	THORIUM	2/25/2014	0.476	Yes	Y				0.0697	0.0697	pci/g
FB023-20140214	160-5606-2	URANIUM	2/27/2014	0.0241	Yes	Y	U		U	0.147	0.147	pci/l
FB023-20140214	160-5606-2	URANIUM 233 AND 234	2/27/2014	0.0142	Yes	Y	U		U	0.118	0.118	pci/l
FB023-20140214	160-5606-2	URANIUM-235	2/27/2014	-0.0106	Yes	Y	U		U	0.147	0.147	pci/l
FB023-20140214	160-5606-2	THORIUM-230	3/4/2014	0.0519	Yes	Y	U		U	0.210	0.210	pci/l
FB023-20140214	160-5606-2	THORIUM	3/4/2014	0	Yes	Y	U		U	0.0882	0.0882	pci/l
FB023-20140214	160-5606-2	THORIUM-228	3/4/2014	0.153	Yes	Y	U		U	0.266	0.266	pci/l
LT-R-003-20140214	160-5606-5	URANIUM-235	2/25/2014	0.0273	Yes	Y	U		U	0.0410	0.0410	pci/g
LT-R-003-20140214	160-5606-5	URANIUM 233 AND 234	2/25/2014	0.361	Yes	Y				0.0894	0.0894	pci/g
LT-R-003-20140214	160-5606-5	URANIUM	2/25/2014	0.375	Yes	Y				0.0668	0.0668	pci/g
LT-R-003-20140214	160-5606-5	THORIUM	2/25/2014	0.58	Yes	Y				0.0519	0.0519	pci/g
LT-R-003-20140214	160-5606-5	THORIUM-230	2/25/2014	0.613	Yes	Y		U	U	0.0652	0.0652	pci/g
LT-R-003-20140214	160-5606-5	THORIUM-228	2/25/2014	0.387	Yes	Y				0.0960	0.0960	pci/g

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601069191A	1601069191A	URANIUM-235	2/28/2014	0.005363	Yes	Y	U		U	0.0181	0.0181	pci/g
1601069191A	1601069191A	PROTACTINIUM 231	2/28/2014	-0.002315	Yes	Y	U		U	0.0706	0.0706	pci/g
1601069191A	1601069191A	Protactinium 234	2/28/2014	-0.06947	Yes	Y	U		U	0.430	0.430	pci/g
1601069191A	1601069191A	RADIUM-226	2/28/2014	-0.04153	Yes	Y	U		U	0.0788	0.0788	pci/g
1601069191A	1601069191A	RADIUM-228	2/28/2014	0.01787	Yes	Y				0.00792	0.00792	pci/g
1601069191A	1601069191A	THALLIUM-208	2/28/2014	0.002851	Yes	Y	U		U	0.00438	0.00438	pci/g
1601069191A	1601069191A	URANIUM	2/28/2014	0.00548	Yes	Y	U		U	0.0694	0.0694	pci/g
1601069191A	1601069191A	LEAD-212	2/28/2014	-0.0003309	Yes	Y	U		U	0.00635	0.00635	pci/g
1601069191A	1601069191A	THORIUM-234	2/28/2014	0.00548	Yes	Y	U		U	0.0694	0.0694	pci/g
1601069191A	1601069191A	LEAD-214	2/28/2014	0.001216	Yes	Y	U		U	0.00905	0.00905	pci/g
1601069191A	1601069191A	LEAD-210	2/28/2014	0.03697	Yes	Y	U		U	0.0825	0.0825	pci/g
1601069191A	1601069191A	COBALT-60	2/28/2014	0.000495	Yes	Y	U		U	0.00412	0.00412	pci/g
1601069191A	1601069191A	CESIUM-137	2/28/2014	-0.001372	Yes	Y	U		U	0.00415	0.00415	pci/g
1601069191A	1601069191A	BISMUTH-214	2/28/2014	0.0001298	Yes	Y	U		U	0.0106	0.0106	pci/g
1601069191A	1601069191A	BISMUTH-212	2/28/2014	0.008822	Yes	Y	U		U	0.0487	0.0487	pci/g
1601069191A	1601069191A	AMERICIUM-241	2/28/2014	0.001112	Yes	Y	U		U	0.00645	0.00645	pci/g
1601069191A	1601069191A	ACTINIUM 228	2/28/2014	0.01787	Yes	Y				0.00792	0.00792	pci/g
1601069191A	1601069191A	POTASSIUM-40	2/28/2014	-0.008235	Yes	Y	U		U	0.0706	0.0706	pci/g
1601069291A	1601069291A	CESIUM-137	2/24/2014	1.558	Yes	Y	U		U	4.81	4.81	pci/l
1601069291A	1601069291A	BISMUTH-212	2/24/2014	19.49	Yes	Y	U		U	49.8	49.8	pci/l
1601069291A	1601069291A	AMERICIUM-241	2/24/2014	0.1002	Yes	Y	U		U	6.15	6.15	pci/l
1601069291A	1601069291A	BISMUTH-214	2/24/2014	-1.877	Yes	Y	U		U	11.4	11.4	pci/l
1601069291A	1601069291A	Protactinium 234	2/24/2014	-163.4	Yes	Y	U		U	723	723	pci/l
1601069291A	1601069291A	LEAD-212	2/24/2014	3.144	Yes	Y	U		U	6.87	6.87	pci/l
1601069291A	1601069291A	ACTINIUM 228	2/24/2014	11.82	Yes	Y	U		U	15.6	15.6	pci/l

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601069291A	1601069291A	COBALT-60	2/24/2014	1.211	Yes	Y	U		U	5.14	5.14	pci/l
1601069291A	1601069291A	LEAD-214	2/24/2014	13.62	Yes	Y				7.13	7.13	pci/l
1601069291A	1601069291A	POTASSIUM-40	2/24/2014	-8.588	Yes	Y	U		U	77.1	77.1	pci/l
1601069291A	1601069291A	PROTACTINIUM 231	2/24/2014	35.59	Yes	Y	U		U	87.2	87.2	pci/l
CC-C-013-4-6-20140212	160-5606-1	PROTACTINIUM 231	2/26/2014	-0.177	Yes	Y	U		U	0.280	0.280	pci/g
CC-C-013-4-6-20140212	160-5606-1	RADIUM-226	2/26/2014	1.15	Yes	Y				0.200	0.200	pci/g
CC-C-013-4-6-20140212	160-5606-1	THALLIUM-208	2/26/2014	0.19	Yes	Y				0.00965	0.00965	pci/g
CC-C-013-4-6-20140212	160-5606-1	RADIUM-228	2/26/2014	0.587	Yes	Y		U	U	0.0300	0.0300	pci/g
CC-C-013-4-6-20140212	160-5606-1	ACTINIUM 228	2/26/2014	0.587	Yes	Y				0.0300	0.0300	pci/g
CC-C-013-4-6-20140212	160-5606-1	Protactinium 234	2/26/2014	0.854	Yes	Y	U		U	1.21	1.21	pci/g
CC-C-013-4-6-20140212	160-5606-1	URANIUM	2/26/2014	0.591	Yes	Y				0.209	0.209	pci/g
CC-C-013-4-6-20140212	160-5606-1	BISMUTH-212	2/26/2014	0.589	Yes	Y				0.108	0.108	pci/g
CC-C-013-4-6-20140212	160-5606-1	POTASSIUM-40	2/26/2014	7.73	Yes	Y				0.107	0.107	pci/g
CC-C-013-4-6-20140212	160-5606-1	LEAD-214	2/26/2014	0.491	Yes	Y				0.0188	0.0188	pci/g
CC-C-013-4-6-20140212	160-5606-1	LEAD-212	2/26/2014	0.561	Yes	Y				0.0163	0.0163	pci/g
CC-C-013-4-6-20140212	160-5606-1	LEAD-210	2/26/2014	0.522	Yes	Y				0.184	0.184	pci/g
CC-C-013-4-6-20140212	160-5606-1	URANIUM-235	2/26/2014	0.0365	Yes	Y	U		U	0.0580	0.0580	pci/g
CC-C-013-4-6-20140212	160-5606-1	BISMUTH-214	2/26/2014	0.46	Yes	Y				0.0211	0.0211	pci/g
CC-C-013-4-6-20140212	160-5606-1	THORIUM-234	2/26/2014	0.591	Yes	Y				0.209	0.209	pci/g
CC-C-013-4-6-20140212LR	160-5606-1LR	ACTINIUM 228	2/25/2014	0.5686	Yes	Y				0.0258	0.0258	pci/g
CC-C-013-4-6-20140212LR	160-5606-1LR	THALLIUM-208	2/25/2014	0.1861	Yes	Y				0.00705	0.00705	pci/g
CC-C-013-4-6-20140212LR	160-5606-1LR	PROTACTINIUM 231	2/25/2014	-0.192	Yes	Y	U		U	0.209	0.209	pci/g
CC-C-013-4-6-20140212LR	160-5606-1LR	POTASSIUM-40	2/25/2014	8.224	Yes	Y				0.0822	0.0822	pci/g
CC-C-013-4-6-20140212LR	160-5606-1LR	LEAD-214	2/25/2014	0.4901	Yes	Y				0.0147	0.0147	pci/g
CC-C-013-4-6-20140212LR	160-5606-1LR	LEAD-212	2/25/2014	0.6072	Yes	Y				0.0114	0.0114	pci/g

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CC-C-013-4-6-20140212LR	160-5606-1LR	THORIUM-234	2/25/2014	0.6393	Yes	Y				0.169	0.169	pci/g
CC-C-013-4-6-20140212LR	160-5606-1LR	LEAD-210	2/25/2014	0.4755	Yes	Y				0.158	0.158	pci/g
CC-C-013-4-6-20140212LR	160-5606-1LR	COBALT-60	2/25/2014	-0.0005364	Yes	Y	U		U	0.00806	0.00806	pci/g
CC-C-013-4-6-20140212LR	160-5606-1LR	CESIUM-137	2/25/2014	0.07221	Yes	Y				0.00717	0.00717	pci/g
CC-C-013-4-6-20140212LR	160-5606-1LR	BISMUTH-214	2/25/2014	0.4348	Yes	Y				0.0145	0.0145	pci/g
CC-C-013-4-6-20140212LR	160-5606-1LR	AMERICIUM-241	2/25/2014	0.008251	Yes	Y	U		U	0.0141	0.0141	pci/g
CC-C-013-4-6-20140212LR	160-5606-1LR	URANIUM	2/25/2014	0.6393	Yes	Y				0.169	0.169	pci/g
CC-C-013-4-6-20140212LR	160-5606-1LR	URANIUM-235	2/25/2014	0.06383	Yes	Y				0.0359	0.0359	pci/g
CC-C-013-4-6-20140212LR	160-5606-1LR	BISMUTH-212	2/25/2014	0.6172	Yes	Y				0.0858	0.0858	pci/g
CC-C-013-4-6-20140212LR	160-5606-1LR	Protactinium 234	2/25/2014	0.4016	Yes	Y	U		U	1.04	1.04	pci/g
CC-C-013-4-6-20140212LR	160-5606-1LR	RADIUM-226	2/25/2014	1.245	Yes	Y				0.174	0.174	pci/g
CC-C-013-4-6-20140212LR	160-5606-1LR	RADIUM-228	2/25/2014	0.5686	Yes	Y				0.0258	0.0258	pci/g
CC-C-33-4-6-20140214	160-5606-3	URANIUM	2/25/2014	0.967	Yes	Y				0.203	0.203	pci/g
CC-C-33-4-6-20140214	160-5606-3	THORIUM-234	2/25/2014	0.967	Yes	Y				0.203	0.203	pci/g
CC-C-33-4-6-20140214	160-5606-3	THALLIUM-208	2/25/2014	0.269	Yes	Y				0.00884	0.00884	pci/g
CC-C-33-4-6-20140214	160-5606-3	RADIUM-226	2/25/2014	2.13	Yes	Y				0.189	0.189	pci/g
CC-C-33-4-6-20140214	160-5606-3	Protactinium 234	2/25/2014	1.26	Yes	Y	U		U	1.29	1.29	pci/g
CC-C-33-4-6-20140214	160-5606-3	PROTACTINIUM 231	2/25/2014	-0.358	Yes	Y	U		U	0.275	0.275	pci/g
CC-C-33-4-6-20140214	160-5606-3	BISMUTH-212	2/25/2014	0.889	Yes	Y				0.120	0.120	pci/g
CC-C-33-4-6-20140214	160-5606-3	URANIUM-235	2/25/2014	0.0742	Yes	Y				0.0438	0.0438	pci/g
CC-C-33-4-6-20140214	160-5606-3	POTASSIUM-40	2/25/2014	8.45	Yes	Y				0.100	0.100	pci/g
CC-C-33-4-6-20140214	160-5606-3	ACTINIUM 228	2/25/2014	0.781	Yes	Y				0.0266	0.0266	pci/g
CC-C-33-4-6-20140214	160-5606-3	RADIUM-228	2/25/2014	0.781	Yes	Y		U	U	0.0266	0.0266	pci/g
CC-C-33-4-6-20140214	160-5606-3	BISMUTH-214	2/25/2014	0.744	Yes	Y				0.0180	0.0180	pci/g
CC-C-33-4-6-20140214	160-5606-3	LEAD-210	2/25/2014	0.845	Yes	Y				0.182	0.182	pci/g

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
CC-C-33-4-6-20140214	160-5606-3	LEAD-212	2/25/2014	0.842	Yes	Y				0.0140	0.0140	pci/g
CC-C-33-4-6-20140214	160-5606-3	LEAD-214	2/25/2014	0.827	Yes	Y				0.0167	0.0167	pci/g
CC-C-36-4-6-20140214	160-5606-4	LEAD-210	2/25/2014	0.436	Yes	Y				0.172	0.172	pci/g
CC-C-36-4-6-20140214	160-5606-4	URANIUM-235	2/25/2014	0.0255	Yes	Y	U		U	0.0539	0.0539	pci/g
CC-C-36-4-6-20140214	160-5606-4	Protactinium 234	2/25/2014	0.794	Yes	Y	U		U	1.21	1.21	pci/g
CC-C-36-4-6-20140214	160-5606-4	THORIUM-234	2/25/2014	0.541	Yes	Y				0.204	0.204	pci/g
CC-C-36-4-6-20140214	160-5606-4	THALLIUM-208	2/25/2014	0.184	Yes	Y				0.00975	0.00975	pci/g
CC-C-36-4-6-20140214	160-5606-4	RADIUM-226	2/25/2014	0.995	Yes	Y				0.185	0.185	pci/g
CC-C-36-4-6-20140214	160-5606-4	URANIUM	2/25/2014	0.541	Yes	Y				0.204	0.204	pci/g
CC-C-36-4-6-20140214	160-5606-4	PROTACTINIUM 231	2/25/2014	0.251	Yes	Y	U		U	0.260	0.260	pci/g
CC-C-36-4-6-20140214	160-5606-4	POTASSIUM-40	2/25/2014	7.54	Yes	Y				0.100	0.100	pci/g
CC-C-36-4-6-20140214	160-5606-4	LEAD-212	2/25/2014	0.524	Yes	Y				0.0152	0.0152	pci/g
CC-C-36-4-6-20140214	160-5606-4	BISMUTH-214	2/25/2014	0.389	Yes	Y				0.0182	0.0182	pci/g
CC-C-36-4-6-20140214	160-5606-4	ACTINIUM 228	2/25/2014	0.535	Yes	Y				0.0311	0.0311	pci/g
CC-C-36-4-6-20140214	160-5606-4	BISMUTH-212	2/25/2014	0.56	Yes	Y				0.0942	0.0942	pci/g
CC-C-36-4-6-20140214	160-5606-4	RADIUM-228	2/25/2014	0.535	Yes	Y		U	U	0.0311	0.0311	pci/g
CC-C-36-4-6-20140214	160-5606-4	LEAD-214	2/25/2014	0.466	Yes	Y				0.0163	0.0163	pci/g
FB023-20140214	160-5606-2	POTASSIUM-40	2/24/2014	12.8	Yes	Y	U		U	83.9	83.9	pci/l
FB023-20140214	160-5606-2	PROTACTINIUM 231	2/24/2014	29.5	Yes	Y	U		U	135	135	pci/l
FB023-20140214	160-5606-2	LEAD-214	2/24/2014	-5.75	Yes	Y	U		U	13.2	13.2	pci/l
FB023-20140214	160-5606-2	LEAD-212	2/24/2014	-0.124	Yes	Y	U		U	9.51	9.51	pci/l
FB023-20140214	160-5606-2	CESIUM-137	2/24/2014	1.61	Yes	Y	U		U	4.95	4.95	pci/l
FB023-20140214	160-5606-2	BISMUTH-212	2/24/2014	4.61	Yes	Y	U		U	63.2	63.2	pci/l
FB023-20140214	160-5606-2	ACTINIUM 228	2/24/2014	24.6	Yes	Y				13.8	13.8	pci/l
FB023-20140214	160-5606-2	BISMUTH-214	2/24/2014	-1.27	Yes	Y	U		U	12.6	12.6	pci/l

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detact	Lab Qual	Val Qual	Final qual	RL	MDL	Units
FB023-20140214	160-5606-2	Protactinium 234	2/24/2014	302	Yes	Y	U		U	586	586	pci/l
FB023-20140214LR	160-5606-2LR	POTASSIUM-40	2/25/2014	8.455	Yes	Y	U		U	71.8	71.8	pci/l
FB023-20140214LR	160-5606-2LR	PROTACTINIUM 231	2/25/2014	0.144	Yes	Y	U		U	126	126	pci/l
FB023-20140214LR	160-5606-2LR	LEAD-214	2/25/2014	3.292	Yes	Y	U		U	9.51	9.51	pci/l
FB023-20140214LR	160-5606-2LR	LEAD-212	2/25/2014	1.271	Yes	Y	U		U	8.52	8.52	pci/l
FB023-20140214LR	160-5606-2LR	COBALT-60	2/25/2014	0.7626	Yes	Y	U		U	4.79	4.79	pci/l
FB023-20140214LR	160-5606-2LR	CESIUM-137	2/25/2014	1.137	Yes	Y	U		U	4.40	4.40	pci/l
FB023-20140214LR	160-5606-2LR	BISMUTH-214	2/25/2014	1.907	Yes	Y	U		U	10.5	10.5	pci/l
FB023-20140214LR	160-5606-2LR	AMERICIUM-241	2/25/2014	0.01697	Yes	Y	U		U	8.83	8.83	pci/l
FB023-20140214LR	160-5606-2LR	ACTINIUM 228	2/25/2014	26.8	Yes	Y				10.4	10.4	pci/l
FB023-20140214LR	160-5606-2LR	Protactinium 234	2/25/2014	140.2	Yes	Y	U		U	452	452	pci/l
FB023-20140214LR	160-5606-2LR	BISMUTH-212	2/25/2014	0	Yes	Y	U		U	59.0	59.0	pci/l
LT-R-003-20140214	160-5606-5	BISMUTH-214	2/25/2014	0.395	Yes	Y				0.0126	0.0126	pci/g
LT-R-003-20140214	160-5606-5	Protactinium 234	2/25/2014	0.761	Yes	Y	U		U	0.791	0.791	pci/g
LT-R-003-20140214	160-5606-5	PROTACTINIUM 231	2/25/2014	-0.253	Yes	Y	U		U	0.189	0.189	pci/g
LT-R-003-20140214	160-5606-5	POTASSIUM-40	2/25/2014	8.28	Yes	Y				0.0673	0.0673	pci/g
LT-R-003-20140214	160-5606-5	LEAD-214	2/25/2014	0.437	Yes	Y				0.0145	0.0145	pci/g
LT-R-003-20140214	160-5606-5	RADIUM-228	2/25/2014	0.531	Yes	Y		U	U	0.0231	0.0231	pci/g
LT-R-003-20140214	160-5606-5	LEAD-210	2/25/2014	0.471	Yes	Y				0.146	0.146	pci/g
LT-R-003-20140214	160-5606-5	THALLIUM-208	2/25/2014	0.167	Yes	Y				0.00630	0.00630	pci/g
LT-R-003-20140214	160-5606-5	BISMUTH-212	2/25/2014	0.583	Yes	Y				0.0786	0.0786	pci/g
LT-R-003-20140214	160-5606-5	ACTINIUM 228	2/25/2014	0.531	Yes	Y				0.0231	0.0231	pci/g
LT-R-003-20140214	160-5606-5	LEAD-212	2/25/2014	0.565	Yes	Y				0.00997	0.00997	pci/g
LT-R-003-20140214	160-5606-5	RADIUM-226	2/25/2014	0.843	Yes	Y				0.132	0.132	pci/g
LT-R-003-20140214	160-5606-5	THORIUM-234	2/25/2014	0.519	Yes	Y				0.154	0.154	pci/g

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Analytical Method		E901.1										
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-R-003-20140214	160-5606-5	URANIUM	2/25/2014	0.519	Yes	Y				0.154	0.154	pci/g
LT-R-003-20140214	160-5606-5	URANIUM-235	2/25/2014	0.0369	Yes	Y				0.0343	0.0343	pci/g

Analytical Method		E903.0										
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601066041A	1601066041A	RADIUM-226	2/21/2014	0.03358	Yes	Y	U		U	0.221	0.221	pci/l
FB023-20140214	160-5606-2	RADIUM-226	2/21/2014	0.0216	Yes	Y	U		U	0.225	0.225	pci/l
FB023-20140214LR	160-5606-2LR	RADIUM-226	2/21/2014	0.09625	Yes	Y	U		U	0.190	0.190	pci/l

Analytical Method		E904.0										
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601066051A	1601066051A	RADIUM-228	2/24/2014	0.1393	Yes	Y	U		U	0.376	0.376	pci/l
FB023-20140214	160-5606-2	RADIUM-228	2/24/2014	0.0385	Yes	Y	U		U	0.356	0.356	pci/l

Analytical Method A-01-R

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601069581A	1601069581A	THORIUM	2/28/2014	0.001747	Yes	Y	U		U	0.181	0.181	pci/l
1601069581A	1601069581A	THORIUM-228	2/28/2014	-0.001755	Yes	Y	U		U	0.229	0.229	pci/l
1601069581A	1601069581A	THORIUM-230	2/28/2014	0.1642	Yes	Y	U		U	0.264	0.264	pci/l
1601069591A	1601069591A	URANIUM	2/27/2014	0.06067	Yes	Y	U		U	0.0982	0.0982	pci/l
1601069591A	1601069591A	URANIUM-235	2/27/2014	-0.005043	Yes	Y	U		U	0.122	0.122	pci/l
1601069591A	1601069591A	URANIUM 233 AND 234	2/27/2014	0.01351	Yes	Y	U		U	0.112	0.112	pci/l
1601072531A	1601072531A	THORIUM-230	2/28/2014	0.07902	Yes	Y				0.0623	0.0623	pci/g
1601072531A	1601072531A	THORIUM	2/28/2014	0.007936	Yes	Y	U		U	0.0533	0.0533	pci/g
1601072531A	1601072531A	THORIUM-228	2/28/2014	-0.002189	Yes	Y	U		U	0.103	0.103	pci/g
1601072561A	1601072561A	URANIUM-235	2/27/2014	-0.005814	Yes	Y	U		U	0.114	0.114	pci/g
1601072561A	1601072561A	URANIUM 233 AND 234	2/27/2014	0.006675	Yes	Y	U		U	0.102	0.102	pci/g
1601072561A	1601072561A	URANIUM	2/27/2014	-0.03131	Yes	Y	U		U	0.108	0.108	pci/g
FB025-20140218	160-5651-3	URANIUM-235	2/27/2014	-0.0149	Yes	Y	U		U	0.151	0.151	pci/l
FB025-20140218	160-5651-3	URANIUM	2/27/2014	0.0478	Yes	Y	U		U	0.130	0.130	pci/l
FB025-20140218	160-5651-3	URANIUM 233 AND 234	2/27/2014	0.00533	Yes	Y	U		U	0.130	0.130	pci/l
FB025-20140218	160-5651-3	THORIUM-230	2/28/2014	0.198	Yes	Y				0.178	0.178	pci/l
FB025-20140218	160-5651-3	THORIUM-228	2/28/2014	0.0103	Yes	Y	U		U	0.229	0.229	pci/l
FB025-20140218	160-5651-3	THORIUM	2/28/2014	-0.00876	Yes	Y	U		U	0.121	0.121	pci/l
LT-XC-021-4-6-20140218	160-5651-1	URANIUM-235	2/27/2014	-0.00267	Yes	Y	U		U	0.0649	0.0649	pci/g
LT-XC-021-4-6-20140218	160-5651-1	URANIUM	2/27/2014	0.188	Yes	Y				0.0651	0.0651	pci/g
LT-XC-021-4-6-20140218	160-5651-1	URANIUM 233 AND 234	2/27/2014	0.171	Yes	Y				0.0934	0.0934	pci/g
LT-XC-021-4-6-20140218	160-5651-1	THORIUM	2/28/2014	0.2	Yes	Y				0.0575	0.0575	pci/g
LT-XC-021-4-6-20140218	160-5651-1	THORIUM-228	2/28/2014	0.258	Yes	Y				0.0975	0.0975	pci/g
LT-XC-021-4-6-20140218	160-5651-1	THORIUM-230	2/28/2014	0.27	Yes	Y		U	U	0.0775	0.0775	pci/g
LT-XC-021-4-6-20140218LR	160-5651-1LR	URANIUM-235	2/27/2014	0.0164	Yes	Y	U		U	0.0999	0.0999	pci/g

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Analytical Method A-01-R

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-XC-021-4-6-20140218LR	160-5651-1LR	URANIUM	2/27/2014	0.1779	Yes	Y				0.109	0.109	pci/g
LT-XC-021-4-6-20140218LR	160-5651-1LR	URANIUM 233 AND 234	2/27/2014	0.2481	Yes	Y				0.146	0.146	pci/g
LT-XC-021-4-6-20140218LR	160-5651-1LR	THORIUM	2/28/2014	0.1267	Yes	Y				0.0566	0.0566	pci/g
LT-XC-021-4-6-20140218LR	160-5651-1LR	THORIUM-228	2/28/2014	0.1252	Yes	Y				0.0623	0.0623	pci/g
LT-XC-021-4-6-20140218LR	160-5651-1LR	THORIUM-230	2/28/2014	0.3139	Yes	Y				0.0778	0.0778	pci/g
LT-XC-023-8-10-20140219	160-5651-2	URANIUM-235	2/27/2014	0.014	Yes	Y	U		U	0.116	0.116	pci/g
LT-XC-023-8-10-20140219	160-5651-2	URANIUM 233 AND 234	2/27/2014	0.438	Yes	Y				0.138	0.138	pci/g
LT-XC-023-8-10-20140219	160-5651-2	URANIUM	2/27/2014	0.507	Yes	Y				0.110	0.110	pci/g
LT-XC-023-8-10-20140219	160-5651-2	THORIUM	2/28/2014	0.319	Yes	Y				0.0622	0.0622	pci/g
LT-XC-023-8-10-20140219	160-5651-2	THORIUM-228	2/28/2014	0.588	Yes	Y				0.0980	0.0980	pci/g
LT-XC-023-8-10-20140219	160-5651-2	THORIUM-230	2/28/2014	0.449	Yes	Y		U	U	0.0778	0.0778	pci/g

Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601072481A	1601072481A	POTASSIUM-40	2/25/2014	-0.006568	Yes	Y	U		U	0.0767	0.0767	pci/g
1601072481A	1601072481A	BISMUTH-212	2/25/2014	0.02849	Yes	Y	U		U	0.0550	0.0550	pci/g
1601072481A	1601072481A	AMERICIUM-241	2/25/2014	-0.0003514	Yes	Y	U		U	0.00518	0.00518	pci/g
1601072481A	1601072481A	CESIUM-137	2/25/2014	-0.001025	Yes	Y	U		U	0.00515	0.00515	pci/g
1601072481A	1601072481A	ACTINIUM 228	2/25/2014	0.00381	Yes	Y	U		U	0.0158	0.0158	pci/g
1601072481A	1601072481A	COBALT-60	2/25/2014	-0.001376	Yes	Y	U		U	0.00544	0.00544	pci/g
1601072481A	1601072481A	LEAD-210	2/25/2014	-0.002154	Yes	Y	U		U	0.0823	0.0823	pci/g
1601072481A	1601072481A	LEAD-214	2/25/2014	0.004087	Yes	Y	U		U	0.00782	0.00782	pci/g
1601072481A	1601072481A	PROTACTINIUM 231	2/25/2014	0.01072	Yes	Y	U		U	0.102	0.102	pci/g
1601072481A	1601072481A	Protactinium 234	2/25/2014	-0.4007	Yes	Y	U		U	0.722	0.722	pci/g
1601072481A	1601072481A	RADIUM-226	2/25/2014	0.02398	Yes	Y	U		U	0.0831	0.0831	pci/g

Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601072481A	1601072481A	BISMUTH-214	2/25/2014	-0.002894	Yes	Y	U		U	0.0108	0.0108	pci/g
1601072481A	1601072481A	LEAD-212	2/25/2014	0.0005721	Yes	Y	U		U	0.00622	0.00622	pci/g
1601072481A	1601072481A	RADIUM-228	2/25/2014	0.00381	Yes	Y	U		U	0.0158	0.0158	pci/g
1601072481A	1601072481A	THALLIUM-208	2/25/2014	0.0007755	Yes	Y	U		U	0.00476	0.00476	pci/g
1601072481A	1601072481A	THORIUM-234	2/25/2014	0.01542	Yes	Y	U		U	0.0766	0.0766	pci/g
1601072481A	1601072481A	URANIUM	2/25/2014	0.01542	Yes	Y	U		U	0.0766	0.0766	pci/g
1601072481A	1601072481A	URANIUM-235	2/25/2014	0.005694	Yes	Y	U		U	0.0181	0.0181	pci/g
1601075411A	1601075411A	LEAD-214	3/6/2014	5.037	Yes	Y	U		U	8.70	8.70	pci/l
1601075411A	1601075411A	COBALT-60	3/6/2014	1.157	Yes	Y	U		U	3.50	3.50	pci/l
1601075411A	1601075411A	LEAD-212	3/6/2014	1.244	Yes	Y	U		U	6.87	6.87	pci/l
1601075411A	1601075411A	POTASSIUM-40	3/6/2014	19.48	Yes	Y	U		U	53.3	53.3	pci/l
1601075411A	1601075411A	PROTACTINIUM 231	3/6/2014	20.45	Yes	Y	U		U	99.7	99.7	pci/l
1601075411A	1601075411A	Protactinium 234	3/6/2014	-398.7	Yes	Y	U		U	582	582	pci/l
1601075411A	1601075411A	BISMUTH-212	3/6/2014	2.606	Yes	Y	U		U	45.6	45.6	pci/l
1601075411A	1601075411A	CESIUM-137	3/6/2014	0.8247	Yes	Y	U		U	3.43	3.43	pci/l
1601075411A	1601075411A	BISMUTH-214	3/6/2014	1.654	Yes	Y	U		U	9.05	9.05	pci/l
1601075411A	1601075411A	ACTINIUM 228	3/6/2014	5.464	Yes	Y	U		U	11.6	11.6	pci/l
1601075411A	1601075411A	AMERICIUM-241	3/6/2014	1.984	Yes	Y	U		U	6.94	6.94	pci/l
FB025-20140218	160-5651-3	LEAD-214	2/27/2014	0.885	Yes	Y	U		U	9.26	9.26	pci/l
FB025-20140218	160-5651-3	PROTACTINIUM 231	2/27/2014	3.25	Yes	Y	U		U	104	104	pci/l
FB025-20140218	160-5651-3	Protactinium 234	2/27/2014	192	Yes	Y	U		U	384	384	pci/l
FB025-20140218	160-5651-3	CESIUM-137	2/27/2014	-0.13	Yes	Y	U		U	4.37	4.37	pci/l
FB025-20140218	160-5651-3	BISMUTH-214	2/27/2014	-8.47	Yes	Y	U		U	11.5	11.5	pci/l
FB025-20140218	160-5651-3	BISMUTH-212	2/27/2014	10.4	Yes	Y	U		U	39.0	39.0	pci/l
FB025-20140218	160-5651-3	ACTINIUM 228	2/27/2014	9.44	Yes	Y	U		U	11.8	11.8	pci/l

Analytical Method		E901.1										
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
FB025-20140218	160-5651-3	LEAD-212	2/27/2014	-0.334	Yes	Y	U		U	8.48	8.48	pci/l
FB025-20140218	160-5651-3	POTASSIUM-40	2/27/2014	-6.87	Yes	Y	U		U	59.0	59.0	pci/l
FB025-20140218LR	160-5651-3LR	LEAD-214	2/27/2014	6.699	Yes	Y	U		U	8.56	8.56	pci/l
FB025-20140218LR	160-5651-3LR	PROTACTINIUM 231	2/27/2014	-17.85	Yes	Y	U		U	111	111	pci/l
FB025-20140218LR	160-5651-3LR	ACTINIUM 228	2/27/2014	17.21	Yes	Y				13.5	13.5	pci/l
FB025-20140218LR	160-5651-3LR	AMERICIUM-241	2/27/2014	2.58	Yes	Y	U		U	7.10	7.10	pci/l
FB025-20140218LR	160-5651-3LR	POTASSIUM-40	2/27/2014	52.91	Yes	Y				51.0	51.0	pci/l
FB025-20140218LR	160-5651-3LR	Protactinium 234	2/27/2014	149.5	Yes	Y	U		U	471	471	pci/l
FB025-20140218LR	160-5651-3LR	LEAD-212	2/27/2014	-0.01503	Yes	Y	U		U	7.19	7.19	pci/l
FB025-20140218LR	160-5651-3LR	COBALT-60	2/27/2014	1.072	Yes	Y	U		U	4.63	4.63	pci/l
FB025-20140218LR	160-5651-3LR	CESIUM-137	2/27/2014	0.9251	Yes	Y	U		U	4.92	4.92	pci/l
FB025-20140218LR	160-5651-3LR	BISMUTH-214	2/27/2014	3.107	Yes	Y	U		U	10.7	10.7	pci/l
FB025-20140218LR	160-5651-3LR	BISMUTH-212	2/27/2014	19.17	Yes	Y	U		U	42.7	42.7	pci/l
LT-XC-021-4-6-20140218	160-5651-1	THORIUM-234	2/28/2014	0.14	Yes	Y				0.104	0.104	pci/g
LT-XC-021-4-6-20140218	160-5651-1	LEAD-214	2/28/2014	0.152	Yes	Y				0.0108	0.0108	pci/g
LT-XC-021-4-6-20140218	160-5651-1	BISMUTH-212	2/28/2014	0.246	Yes	Y				0.0616	0.0616	pci/g
LT-XC-021-4-6-20140218	160-5651-1	BISMUTH-214	2/28/2014	0.136	Yes	Y				0.0108	0.0108	pci/g
LT-XC-021-4-6-20140218	160-5651-1	LEAD-210	2/28/2014	0.105	Yes	Y				0.0951	0.0951	pci/g
LT-XC-021-4-6-20140218	160-5651-1	LEAD-212	2/28/2014	0.178	Yes	Y				0.00716	0.00716	pci/g
LT-XC-021-4-6-20140218	160-5651-1	ACTINIUM 228	2/28/2014	0.171	Yes	Y				0.0162	0.0162	pci/g
LT-XC-021-4-6-20140218	160-5651-1	POTASSIUM-40	2/28/2014	6.99	Yes	Y				0.0593	0.0593	pci/g
LT-XC-021-4-6-20140218	160-5651-1	PROTACTINIUM 231	2/28/2014	-0.0749	Yes	Y	U		U	0.131	0.131	pci/g
LT-XC-021-4-6-20140218	160-5651-1	Protactinium 234	2/28/2014	0.351	Yes	Y	U		U	0.758	0.758	pci/g
LT-XC-021-4-6-20140218	160-5651-1	RADIUM-226	2/28/2014	0.448	Yes	Y				0.0971	0.0971	pci/g
LT-XC-021-4-6-20140218	160-5651-1	THALLIUM-208	2/28/2014	0.0564	Yes	Y				0.00472	0.00472	pci/g

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Analytical Method		E901.1										
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-XC-021-4-6-20140218	160-5651-1	URANIUM	2/28/2014	0.14	Yes	Y				0.104	0.104	pci/g
LT-XC-021-4-6-20140218	160-5651-1	URANIUM-235	2/28/2014	0.00551	Yes	Y	U		U	0.0301	0.0301	pci/g
LT-XC-021-4-6-20140218	160-5651-1	RADIUM-228	2/28/2014	0.171	Yes	Y				0.0162	0.0162	pci/g
LT-XC-021-4-6-20140218LR	160-5651-1LR	ACTINIUM 228	3/11/2014	0.1707	Yes	Y				0.0181	0.0181	pci/g
LT-XC-021-4-6-20140218LR	160-5651-1LR	POTASSIUM-40	3/11/2014	6.634	Yes	Y				0.0655	0.0655	pci/g
LT-XC-021-4-6-20140218LR	160-5651-1LR	LEAD-214	3/11/2014	0.1586	Yes	Y				0.0117	0.0117	pci/g
LT-XC-021-4-6-20140218LR	160-5651-1LR	LEAD-212	3/11/2014	0.163	Yes	Y				0.00899	0.00899	pci/g
LT-XC-021-4-6-20140218LR	160-5651-1LR	LEAD-210	3/11/2014	0.1355	Yes	Y				0.122	0.122	pci/g
LT-XC-021-4-6-20140218LR	160-5651-1LR	COBALT-60	3/11/2014	0	Yes	Y	U		U	0.00704	0.00704	pci/g
LT-XC-021-4-6-20140218LR	160-5651-1LR	CESIUM-137	3/11/2014	0.00004973	Yes	Y	U		U	0.00688	0.00688	pci/g
LT-XC-021-4-6-20140218LR	160-5651-1LR	BISMUTH-214	3/11/2014	0.1529	Yes	Y				0.0128	0.0128	pci/g
LT-XC-021-4-6-20140218LR	160-5651-1LR	RADIUM-228	3/11/2014	0.1707	Yes	Y				0.0181	0.0181	pci/g
LT-XC-021-4-6-20140218LR	160-5651-1LR	AMERICIUM-241	3/11/2014	-0.000498	Yes	Y	U		U	0.0142	0.0142	pci/g
LT-XC-021-4-6-20140218LR	160-5651-1LR	Protactinium 234	3/11/2014	0.4879	Yes	Y	U		U	0.898	0.898	pci/g
LT-XC-021-4-6-20140218LR	160-5651-1LR	RADIUM-226	3/11/2014	0.4052	Yes	Y				0.113	0.113	pci/g
LT-XC-021-4-6-20140218LR	160-5651-1LR	PROTACTINIUM 231	3/11/2014	0.04844	Yes	Y	UF		U	0.165	0.165	pci/g
LT-XC-021-4-6-20140218LR	160-5651-1LR	THALLIUM-208	3/11/2014	0.05158	Yes	Y				0.00619	0.00619	pci/g
LT-XC-021-4-6-20140218LR	160-5651-1LR	THORIUM-234	3/11/2014	0.2527	Yes	Y				0.128	0.128	pci/g
LT-XC-021-4-6-20140218LR	160-5651-1LR	URANIUM	3/11/2014	0.2527	Yes	Y				0.128	0.128	pci/g
LT-XC-021-4-6-20140218LR	160-5651-1LR	URANIUM-235	3/11/2014	0.01413	Yes	Y	U		U	0.0347	0.0347	pci/g
LT-XC-021-4-6-20140218LR	160-5651-1LR	BISMUTH-212	3/11/2014	0.2093	Yes	Y				0.0688	0.0688	pci/g
LT-XC-023-8-10-20140219	160-5651-2	BISMUTH-212	2/25/2014	0.503	Yes	Y				0.0725	0.0725	pci/g
LT-XC-023-8-10-20140219	160-5651-2	POTASSIUM-40	2/25/2014	5.09	Yes	Y				0.0645	0.0645	pci/g
LT-XC-023-8-10-20140219	160-5651-2	URANIUM-235	2/25/2014	0.0137	Yes	Y	U		U	0.0324	0.0324	pci/g
LT-XC-023-8-10-20140219	160-5651-2	URANIUM	2/25/2014	0.443	Yes	Y				0.150	0.150	pci/g

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-XC-023-8-10-20140219	160-5651-2	THORIUM-234	2/25/2014	0.443	Yes	Y				0.150	0.150	pci/g
LT-XC-023-8-10-20140219	160-5651-2	THALLIUM-208	2/25/2014	0.155	Yes	Y				0.00647	0.00647	pci/g
LT-XC-023-8-10-20140219	160-5651-2	RADIUM-228	2/25/2014	0.457	Yes	Y				0.0220	0.0220	pci/g
LT-XC-023-8-10-20140219	160-5651-2	RADIUM-226	2/25/2014	0.855	Yes	Y				0.131	0.131	pci/g
LT-XC-023-8-10-20140219	160-5651-2	PROTACTINIUM 231	2/25/2014	-0.193	Yes	Y	U		U	0.203	0.203	pci/g
LT-XC-023-8-10-20140219	160-5651-2	LEAD-214	2/25/2014	0.318	Yes	Y				0.0140	0.0140	pci/g
LT-XC-023-8-10-20140219	160-5651-2	LEAD-212	2/25/2014	0.487	Yes	Y				0.00997	0.00997	pci/g
LT-XC-023-8-10-20140219	160-5651-2	BISMUTH-214	2/25/2014	0.272	Yes	Y				0.0126	0.0126	pci/g
LT-XC-023-8-10-20140219	160-5651-2	LEAD-210	2/25/2014	0.307	Yes	Y				0.136	0.136	pci/g
LT-XC-023-8-10-20140219	160-5651-2	ACTINIUM 228	2/25/2014	0.457	Yes	Y				0.0220	0.0220	pci/g
LT-XC-023-8-10-20140219	160-5651-2	Protactinium 234	2/25/2014	0.526	Yes	Y	U		U	0.932	0.932	pci/g

Analytical Method E903.0

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601072871A	1601072871A	RADIUM-226	2/26/2014	0.09811	Yes	Y	U		U	0.181	0.181	pci/l
FB025-20140218	160-5651-3	RADIUM-226	2/26/2014	0.122	Yes	Y	U		U	0.195	0.195	pci/l
FB025-20140218LR	160-5651-3LR	RADIUM-226	2/26/2014	0.2189	Yes	Y				0.174	0.174	pci/l

Analytical Method E904.0

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601072851A	1601072851A	RADIUM-228	3/3/2014	-0.1588	Yes	Y	U		U	0.310	0.310	pci/l
FB025-20140218	160-5651-3	RADIUM-228	3/3/2014	0.0949	Yes	Y	U		U	0.289	0.289	pci/l

SDG: 16056911

Analytical Method		A-01-R										
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601080191A	1601080191A	THORIUM-228	3/5/2014	-0.04209	Yes	Y	U		U	0.574	0.574	pci/l
1601080191A	1601080191A	THORIUM-230	3/5/2014	0.006558	Yes	Y	U		U	0.341	0.341	pci/l
1601080191A	1601080191A	THORIUM	3/5/2014	0.1606	Yes	Y	U		U	0.339	0.339	pci/l
1601080211A	1601080211A	URANIUM	3/5/2014	0.009675	Yes	Y	U		U	0.126	0.126	pci/l
1601080211A	1601080211A	URANIUM 233 AND 234	3/5/2014	0.07756	Yes	Y	U		U	0.164	0.164	pci/l
1601080211A	1601080211A	URANIUM-235	3/5/2014	-0.00517	Yes	Y	U		U	0.126	0.126	pci/l
FB026-20140219	160-5691-1	URANIUM	3/5/2014	0.0893	Yes	Y				0.0670	0.0670	pci/l
FB026-20140219	160-5691-1	URANIUM 233 AND 234	3/5/2014	0.0377	Yes	Y	U		U	0.159	0.159	pci/l
FB026-20140219	160-5691-1	URANIUM-235	3/5/2014	0.0174	Yes	Y	U		U	0.145	0.145	pci/l
FB026-20140219	160-5691-1	THORIUM-230	3/5/2014	0.132	Yes	Y				0.104	0.104	pci/l
FB026-20140219	160-5691-1	THORIUM	3/5/2014	0.0228	Yes	Y	U		U	0.0683	0.0683	pci/l
FB026-20140219	160-5691-1	THORIUM-228	3/5/2014	0.0714	Yes	Y	U		U	0.181	0.181	pci/l

Analytical Method		E901.1										
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601078771A	1601078771A	POTASSIUM-40	2/28/2014	-51.2	Yes	Y	U		U	61.2	61.2	pci/l
1601078771A	1601078771A	ACTINIUM 228	2/28/2014	9.046	Yes	Y	U		U	11.2	11.2	pci/l
1601078771A	1601078771A	PROTACTINIUM 231	2/28/2014	8.099	Yes	Y	U		U	110	110	pci/l
1601078771A	1601078771A	LEAD-214	2/28/2014	-1.771	Yes	Y	U		U	9.05	9.05	pci/l
1601078771A	1601078771A	LEAD-212	2/28/2014	-1.979	Yes	Y	U		U	7.23	7.23	pci/l
1601078771A	1601078771A	COBALT-60	2/28/2014	-0.1425	Yes	Y	U		U	3.89	3.89	pci/l
1601078771A	1601078771A	CESIUM-137	2/28/2014	1.815	Yes	Y	U		U	3.47	3.47	pci/l
1601078771A	1601078771A	BISMUTH-214	2/28/2014	2.846	Yes	Y	U		U	10.3	10.3	pci/l
1601078771A	1601078771A	BISMUTH-212	2/28/2014	0	Yes	Y	U		U	43.0	43.0	pci/l
1601078771A	1601078771A	AMERICIUM-241	2/28/2014	6.511	Yes	Y				5.57	5.57	pci/l

SDG: 16056911

Analytical Method		E901.1										
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601078771A	1601078771A	Protactinium 234	2/28/2014	45	Yes	Y	U		U	486	486	pci/l
FB026-20140219	160-5691-1	Protactinium 234	3/5/2014	-536	Yes	Y	U		U	721	721	pci/l
FB026-20140219	160-5691-1	BISMUTH-214	3/5/2014	2.76	Yes	Y	U		U	9.19	9.19	pci/l
FB026-20140219	160-5691-1	CESIUM-137	3/5/2014	1.26	Yes	Y	U		U	4.01	4.01	pci/l
FB026-20140219	160-5691-1	BISMUTH-212	3/5/2014	1.03	Yes	Y	U		U	42.1	42.1	pci/l
FB026-20140219	160-5691-1	LEAD-212	3/5/2014	-1.63	Yes	Y	U		U	7.10	7.10	pci/l
FB026-20140219	160-5691-1	ACTINIUM 228	3/5/2014	11.2	Yes	Y	U		U	11.3	11.3	pci/l
FB026-20140219	160-5691-1	LEAD-214	3/5/2014	2.43	Yes	Y	U		U	8.08	8.08	pci/l
FB026-20140219	160-5691-1	POTASSIUM-40	3/5/2014	47.3	Yes	Y	U		U	55.8	55.8	pci/l
FB026-20140219	160-5691-1	PROTACTINIUM 231	3/5/2014	25.1	Yes	Y	U		U	99.4	99.4	pci/l
FB026-20140219LR	160-5691-1LR	BISMUTH-212	3/5/2014	14.71	Yes	Y	U		U	43.0	43.0	pci/l
FB026-20140219LR	160-5691-1LR	PROTACTINIUM 231	3/5/2014	0.03054	Yes	Y	U		U	97.1	97.1	pci/l
FB026-20140219LR	160-5691-1LR	LEAD-214	3/5/2014	-6.606	Yes	Y	U		U	10.2	10.2	pci/l
FB026-20140219LR	160-5691-1LR	LEAD-212	3/5/2014	0.782	Yes	Y	U		U	7.20	7.20	pci/l
FB026-20140219LR	160-5691-1LR	COBALT-60	3/5/2014	1.326	Yes	Y	U		U	3.88	3.88	pci/l
FB026-20140219LR	160-5691-1LR	BISMUTH-214	3/5/2014	3.582	Yes	Y	U		U	10.5	10.5	pci/l
FB026-20140219LR	160-5691-1LR	AMERICIUM-241	3/5/2014	0.876	Yes	Y	U		U	7.55	7.55	pci/l
FB026-20140219LR	160-5691-1LR	ACTINIUM 228	3/5/2014	9.219	Yes	Y	U		U	11.3	11.3	pci/l
FB026-20140219LR	160-5691-1LR	POTASSIUM-40	3/5/2014	5.723	Yes	Y	U		U	58.8	58.8	pci/l
FB026-20140219LR	160-5691-1LR	CESIUM-137	3/5/2014	0.418	Yes	Y	U		U	4.15	4.15	pci/l
FB026-20140219LR	160-5691-1LR	Protactinium 234	3/5/2014	561.4	Yes	Y				229	229	pci/l

Analytical Method		E903.0										
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601078681A	1601078681A	RADIUM-226	2/28/2014	0.1267	Yes	Y	U		U	0.180	0.180	pci/l

SDG: 16056911

Analytical Method		E903.0										
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
FB026-20140219	160-5691-1	RADIUM-226	2/28/2014	0.131	Yes	Y	U		U	0.175	0.175	pci/l

Analytical Method		E904.0										
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601078671A	1601078671A	RADIUM-228	3/3/2014	0.02661	Yes	Y	U		U	0.286	0.286	pci/l
FB026-20140219	160-5691-1	RADIUM-228	3/3/2014	0.261	Yes	Y	U		U	0.322	0.322	pci/l

Analytical Method A-01-R

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601080191A	1601080191A	THORIUM-230	3/5/2014	0.006558	Yes	Y	U		U	0.341	0.341	pci/l
1601080191A	1601080191A	THORIUM-228	3/5/2014	-0.04209	Yes	Y	U		U	0.574	0.574	pci/l
1601080191A	1601080191A	THORIUM	3/5/2014	0.1606	Yes	Y	U		U	0.339	0.339	pci/l
1601080211A	1601080211A	URANIUM-235	3/5/2014	-0.00517	Yes	Y	U		U	0.126	0.126	pci/l
1601080211A	1601080211A	URANIUM 233 AND 234	3/5/2014	0.07756	Yes	Y	U		U	0.164	0.164	pci/l
1601080211A	1601080211A	URANIUM	3/5/2014	0.009675	Yes	Y	U		U	0.126	0.126	pci/l
1601080241A	1601080241A	THORIUM-228	3/6/2014	0.03541	Yes	Y	U		U	0.0860	0.0860	pci/g
1601080241A	1601080241A	THORIUM-230	3/6/2014	0.009356	Yes	Y	U		U	0.0455	0.0455	pci/g
1601080241A	1601080241A	THORIUM	3/6/2014	0	Yes	Y	U		U	0.0298	0.0298	pci/g
1601091971A	1601091971A	URANIUM 233 AND 234	3/12/2014	0.02636	Yes	Y	U		U	0.0522	0.0522	pci/g
1601091971A	1601091971A	URANIUM-235	3/12/2014	-0.002343	Yes	Y	U		U	0.0569	0.0569	pci/g
1601091971A	1601091971A	URANIUM	3/12/2014	0.01816	Yes	Y	U		U	0.0456	0.0456	pci/g
CC-C-042-6-8-20140220	160-5692-2	THORIUM-230	3/6/2014	0.292	Yes	Y				0.0806	0.0806	pci/g
CC-C-042-6-8-20140220	160-5692-2	THORIUM	3/6/2014	0.206	Yes	Y				0.0802	0.0802	pci/g
CC-C-042-6-8-20140220	160-5692-2	THORIUM-228	3/6/2014	0.258	Yes	Y				0.107	0.107	pci/g
CC-C-042-6-8-20140220	160-5692-2	URANIUM	3/12/2014	0.0653	Yes	Y	U		U	0.0793	0.0793	pci/g
CC-C-042-6-8-20140220	160-5692-2	URANIUM 233 AND 234	3/12/2014	0.233	Yes	Y				0.0767	0.0767	pci/g
CC-C-042-6-8-20140220	160-5692-2	URANIUM-235	3/12/2014	0.00807	Yes	Y	U		U	0.0671	0.0671	pci/g
CC-C-043-10-12-20140220	160-5692-3	THORIUM	3/6/2014	0.347	Yes	Y				0.0620	0.0620	pci/g
CC-C-043-10-12-20140220	160-5692-3	THORIUM-230	3/6/2014	0.315	Yes	Y				0.0652	0.0652	pci/g
CC-C-043-10-12-20140220	160-5692-3	THORIUM-228	3/6/2014	0.353	Yes	Y				0.108	0.108	pci/g
CC-C-043-10-12-20140220	160-5692-3	URANIUM-235	3/12/2014	-0.00265	Yes	Y	U		U	0.0645	0.0645	pci/g
CC-C-043-10-12-20140220	160-5692-3	URANIUM	3/12/2014	0.516	Yes	Y				0.0646	0.0646	pci/g
CC-C-043-10-12-20140220	160-5692-3	URANIUM 233 AND 234	3/12/2014	0.597	Yes	Y				0.0841	0.0841	pci/g
CC-C-044-6-8-20140220	160-5692-4	THORIUM-228	3/9/2014	0.0943	Yes	Y	U		U	0.109	0.109	pci/g

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
CC-C-044-6-8-20140220	160-5692-4	THORIUM	3/9/2014	0.106	Yes	Y				0.0352	0.0352	pci/g
CC-C-044-6-8-20140220	160-5692-4	THORIUM-230	3/9/2014	0.21	Yes	Y				0.0537	0.0537	pci/g
CC-C-044-6-8-20140220	160-5692-4	URANIUM 233 AND 234	3/12/2014	0.357	Yes	Y				0.0721	0.0721	pci/g
CC-C-044-6-8-20140220	160-5692-4	URANIUM	3/12/2014	0.354	Yes	Y				0.0756	0.0756	pci/g
CC-C-044-6-8-20140220	160-5692-4	URANIUM-235	3/12/2014	0.000866	Yes	Y	U		U	0.0897	0.0897	pci/g
CC-C-045-6-8-20140220	160-5692-6	THORIUM-230	3/6/2014	0.493	Yes	Y				0.0380	0.0380	pci/g
CC-C-045-6-8-20140220	160-5692-6	THORIUM	3/6/2014	0.331	Yes	Y				0.0769	0.0769	pci/g
CC-C-045-6-8-20140220	160-5692-6	THORIUM-228	3/6/2014	0.399	Yes	Y				0.109	0.109	pci/g
CC-C-045-6-8-20140220	160-5692-6	URANIUM	3/12/2014	0.48	Yes	Y				0.0547	0.0547	pci/g
CC-C-045-6-8-20140220	160-5692-6	URANIUM 233 AND 234	3/12/2014	0.359	Yes	Y				0.0683	0.0683	pci/g
CC-C-045-6-8-20140220	160-5692-6	URANIUM-235	3/12/2014	0.0238	Yes	Y	U		U	0.0598	0.0598	pci/g
CC-C-046-6-8-20140220	160-5692-8	THORIUM	3/6/2014	0.479	Yes	Y				0.0558	0.0558	pci/g
CC-C-046-6-8-20140220	160-5692-8	THORIUM-230	3/6/2014	0.573	Yes	Y				0.0491	0.0491	pci/g
CC-C-046-6-8-20140220	160-5692-8	THORIUM-228	3/6/2014	0.537	Yes	Y				0.0902	0.0902	pci/g
CC-C-046-6-8-20140220	160-5692-8	URANIUM 233 AND 234	3/12/2014	0.709	Yes	Y				0.0804	0.0804	pci/g
CC-C-046-6-8-20140220	160-5692-8	URANIUM-235	3/12/2014	0.051	Yes	Y	U		U	0.0731	0.0731	pci/g
CC-C-046-6-8-20140220	160-5692-8	URANIUM	3/12/2014	0.531	Yes	Y				0.0339	0.0339	pci/g
FB027-20140220	160-5692-5	URANIUM	3/5/2014	-0.0188	Yes	Y	U		U	0.130	0.130	pci/l
FB027-20140220	160-5692-5	URANIUM 233 AND 234	3/5/2014	0.117	Yes	Y				0.0914	0.0914	pci/l
FB027-20140220	160-5692-5	URANIUM-235	3/5/2014	-0.00937	Yes	Y	U		U	0.130	0.130	pci/l
FB027-20140220	160-5692-5	THORIUM	3/5/2014	-0.018	Yes	Y	U		U	0.317	0.317	pci/l
FB027-20140220	160-5692-5	THORIUM-230	3/5/2014	0.106	Yes	Y	U		U	0.258	0.258	pci/l
FB027-20140220	160-5692-5	THORIUM-228	3/5/2014	-0.0512	Yes	Y	U		U	0.323	0.323	pci/l
LT-C-048-2-4-20140220	160-5692-7	THORIUM	3/6/2014	0.207	Yes	Y				0.0647	0.0647	pci/g
LT-C-048-2-4-20140220	160-5692-7	THORIUM-228	3/6/2014	0.251	Yes	Y				0.0809	0.0809	pci/g

Analytical Method A-01-R

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-C-048-2-4-20140220	160-5692-7	THORIUM-230	3/6/2014	0.376	Yes	Y				0.0375	0.0375	pci/g
LT-C-048-2-4-20140220	160-5692-7	URANIUM 233 AND 234	3/12/2014	0.23	Yes	Y				0.107	0.107	pci/g
LT-C-048-2-4-20140220	160-5692-7	URANIUM	3/12/2014	0.193	Yes	Y				0.0643	0.0643	pci/g
LT-C-048-2-4-20140220	160-5692-7	URANIUM-235	3/12/2014	-0.00289	Yes	Y	U		U	0.0702	0.0702	pci/g
LT-C-049-2-4-20140220	160-5692-9	THORIUM-230	3/6/2014	0.481	Yes	Y				0.0341	0.0341	pci/g
LT-C-049-2-4-20140220	160-5692-9	THORIUM	3/6/2014	0.383	Yes	Y				0.0515	0.0515	pci/g
LT-C-049-2-4-20140220	160-5692-9	THORIUM-228	3/6/2014	0.467	Yes	Y				0.0899	0.0899	pci/g
LT-C-049-2-4-20140220	160-5692-9	URANIUM 233 AND 234	3/12/2014	0.394	Yes	Y				0.0475	0.0475	pci/g
LT-C-049-2-4-20140220	160-5692-9	URANIUM	3/12/2014	0.407	Yes	Y				0.0674	0.0674	pci/g
LT-C-049-2-4-20140220	160-5692-9	URANIUM-235	3/12/2014	-0.00487	Yes	Y	U		U	0.0674	0.0674	pci/g
LT-XC-020-6-8-20140220	160-5692-1	THORIUM	3/6/2014	0.349	Yes	Y				0.0662	0.0662	pci/g
LT-XC-020-6-8-20140220	160-5692-1	THORIUM-228	3/6/2014	0.414	Yes	Y				0.103	0.103	pci/g
LT-XC-020-6-8-20140220	160-5692-1	THORIUM-230	3/6/2014	0.447	Yes	Y				0.0714	0.0714	pci/g
LT-XC-020-6-8-20140220	160-5692-1	URANIUM	3/12/2014	0.416	Yes	Y				0.122	0.122	pci/g
LT-XC-020-6-8-20140220	160-5692-1	URANIUM 233 AND 234	3/12/2014	0.692	Yes	Y				0.0981	0.0981	pci/g
LT-XC-020-6-8-20140220	160-5692-1	URANIUM-235	3/12/2014	0.0852	Yes	Y	U		U	0.122	0.122	pci/g
LT-XC-020-6-8-20140220LR	160-5692-1LR	THORIUM	3/6/2014	0.2924	Yes	Y				0.0337	0.0337	pci/g
LT-XC-020-6-8-20140220LR	160-5692-1LR	THORIUM-228	3/6/2014	0.3629	Yes	Y				0.0893	0.0893	pci/g
LT-XC-020-6-8-20140220LR	160-5692-1LR	THORIUM-230	3/6/2014	0.3938	Yes	Y				0.0515	0.0515	pci/g
LT-XC-020-6-8-20140220LR	160-5692-1LR	URANIUM	3/12/2014	0.4685	Yes	Y				0.0915	0.0915	pci/g
LT-XC-020-6-8-20140220LR	160-5692-1LR	URANIUM 233 AND 234	3/12/2014	0.5295	Yes	Y				0.0917	0.0917	pci/g
LT-XC-020-6-8-20140220LR	160-5692-1LR	URANIUM-235	3/12/2014	-0.01051	Yes	Y	U		U	0.106	0.106	pci/g

Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
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Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601078771A	1601078771A	COBALT-60	2/28/2014	-0.1425	Yes	Y	U		U	3.89	3.89	pci/l
1601078771A	1601078771A	LEAD-214	2/28/2014	-1.771	Yes	Y	U		U	9.05	9.05	pci/l
1601078771A	1601078771A	BISMUTH-214	2/28/2014	2.846	Yes	Y	U		U	10.3	10.3	pci/l
1601078771A	1601078771A	POTASSIUM-40	2/28/2014	-51.2	Yes	Y	U		U	61.2	61.2	pci/l
1601078771A	1601078771A	PROTACTINIUM 231	2/28/2014	8.099	Yes	Y	U		U	110	110	pci/l
1601078771A	1601078771A	Protactinium 234	2/28/2014	45	Yes	Y	U		U	486	486	pci/l
1601078771A	1601078771A	LEAD-212	2/28/2014	-1.979	Yes	Y	U		U	7.23	7.23	pci/l
1601078771A	1601078771A	BISMUTH-212	2/28/2014	0	Yes	Y	U		U	43.0	43.0	pci/l
1601078771A	1601078771A	AMERICIUM-241	2/28/2014	6.511	Yes	Y				5.57	5.57	pci/l
1601078771A	1601078771A	ACTINIUM 228	2/28/2014	9.046	Yes	Y	U		U	11.2	11.2	pci/l
1601078771A	1601078771A	CESIUM-137	2/28/2014	1.815	Yes	Y	U		U	3.47	3.47	pci/l
1601079551A	1601079551A	CESIUM-137	3/4/2014	0.000407	Yes	Y	U		U	0.00381	0.00381	pci/g
1601079551A	1601079551A	Protactinium 234	3/4/2014	-0.13	Yes	Y	U		U	0.764	0.764	pci/g
1601079551A	1601079551A	RADIUM-228	3/4/2014	0.009706	Yes	Y	U		U	0.0166	0.0166	pci/g
1601079551A	1601079551A	PROTACTINIUM 231	3/4/2014	0.01801	Yes	Y	U		U	0.100	0.100	pci/g
1601079551A	1601079551A	POTASSIUM-40	3/4/2014	0	Yes	Y	U		U	0.0805	0.0805	pci/g
1601079551A	1601079551A	LEAD-214	3/4/2014	0.005871	Yes	Y	U		U	0.00780	0.00780	pci/g
1601079551A	1601079551A	LEAD-212	3/4/2014	0.002962	Yes	Y	U		U	0.00703	0.00703	pci/g
1601079551A	1601079551A	COBALT-60	3/4/2014	0.0001524	Yes	Y	U		U	0.00380	0.00380	pci/g
1601079551A	1601079551A	RADIUM-226	3/4/2014	-0.00556	Yes	Y	U		U	0.0812	0.0812	pci/g
1601079551A	1601079551A	BISMUTH-214	3/4/2014	0.003687	Yes	Y	U		U	0.0113	0.0113	pci/g
1601079551A	1601079551A	BISMUTH-212	3/4/2014	0.01583	Yes	Y	U		U	0.0505	0.0505	pci/g
1601079551A	1601079551A	AMERICIUM-241	3/4/2014	0.001496	Yes	Y	U		U	0.00603	0.00603	pci/g
1601079551A	1601079551A	ACTINIUM 228	3/4/2014	0.009706	Yes	Y	U		U	0.0166	0.0166	pci/g
1601079551A	1601079551A	LEAD-210	3/4/2014	0.03886	Yes	Y	U		U	0.0865	0.0865	pci/g

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601079551A	1601079551A	URANIUM-235	3/4/2014	0.01139	Yes	Y	U		U	0.0177	0.0177	pci/g
1601079551A	1601079551A	THALLIUM-208	3/4/2014	0.003029	Yes	Y	U		U	0.00480	0.00480	pci/g
1601079551A	1601079551A	URANIUM	3/4/2014	0.03113	Yes	Y	U		U	0.0779	0.0779	pci/g
1601079551A	1601079551A	THORIUM-234	3/4/2014	0.03113	Yes	Y	U		U	0.0779	0.0779	pci/g
CC-C-042-6-8-20140220	160-5692-2	LEAD-214	3/4/2014	0.203	Yes	Y				0.0101	0.0101	pci/g
CC-C-042-6-8-20140220	160-5692-2	RADIUM-228	3/4/2014	0.253	Yes	Y				0.0155	0.0155	pci/g
CC-C-042-6-8-20140220	160-5692-2	THALLIUM-208	3/4/2014	0.0819	Yes	Y				0.00523	0.00523	pci/g
CC-C-042-6-8-20140220	160-5692-2	THORIUM-234	3/4/2014	0.191	Yes	Y				0.116	0.116	pci/g
CC-C-042-6-8-20140220	160-5692-2	URANIUM	3/4/2014	0.191	Yes	Y				0.116	0.116	pci/g
CC-C-042-6-8-20140220	160-5692-2	RADIUM-226	3/4/2014	0.546	Yes	Y				0.109	0.109	pci/g
CC-C-042-6-8-20140220	160-5692-2	POTASSIUM-40	3/4/2014	5.59	Yes	Y				0.0627	0.0627	pci/g
CC-C-042-6-8-20140220	160-5692-2	Protactinium 234	3/4/2014	0.815	Yes	Y				0.561	0.561	pci/g
CC-C-042-6-8-20140220	160-5692-2	LEAD-212	3/4/2014	0.244	Yes	Y				0.00900	0.00900	pci/g
CC-C-042-6-8-20140220	160-5692-2	PROTACTINIUM 231	3/4/2014	-0.0738	Yes	Y	U		U	0.137	0.137	pci/g
CC-C-042-6-8-20140220	160-5692-2	ACTINIUM 228	3/4/2014	0.253	Yes	Y				0.0155	0.0155	pci/g
CC-C-042-6-8-20140220	160-5692-2	BISMUTH-212	3/4/2014	0.26	Yes	Y				0.0534	0.0534	pci/g
CC-C-042-6-8-20140220	160-5692-2	BISMUTH-214	3/4/2014	0.195	Yes	Y				0.0104	0.0104	pci/g
CC-C-042-6-8-20140220	160-5692-2	LEAD-210	3/4/2014	0.674	Yes	Y				0.123	0.123	pci/g
CC-C-042-6-8-20140220	160-5692-2	URANIUM-235	3/4/2014	0.0312	Yes	Y				0.0310	0.0310	pci/g
CC-C-043-10-12-20140220	160-5692-3	LEAD-214	3/4/2014	0.361	Yes	Y				0.0127	0.0127	pci/g
CC-C-043-10-12-20140220	160-5692-3	BISMUTH-212	3/4/2014	0.434	Yes	Y				0.0700	0.0700	pci/g
CC-C-043-10-12-20140220	160-5692-3	PROTACTINIUM 231	3/4/2014	-0.202	Yes	Y	U		U	0.190	0.190	pci/g
CC-C-043-10-12-20140220	160-5692-3	URANIUM-235	3/4/2014	0.0267	Yes	Y	U		U	0.0333	0.0333	pci/g
CC-C-043-10-12-20140220	160-5692-3	THORIUM-234	3/4/2014	0.547	Yes	Y				0.141	0.141	pci/g
CC-C-043-10-12-20140220	160-5692-3	THALLIUM-208	3/4/2014	0.152	Yes	Y				0.00649	0.00649	pci/g

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
CC-C-043-10-12-20140220	160-5692-3	RADIUM-228	3/4/2014	0.44	Yes	Y				0.0235	0.0235	pci/g
CC-C-043-10-12-20140220	160-5692-3	RADIUM-226	3/4/2014	1	Yes	Y				0.119	0.119	pci/g
CC-C-043-10-12-20140220	160-5692-3	Protactinium 234	3/4/2014	1.6	Yes	Y				0.802	0.802	pci/g
CC-C-043-10-12-20140220	160-5692-3	POTASSIUM-40	3/4/2014	6.72	Yes	Y				0.0634	0.0634	pci/g
CC-C-043-10-12-20140220	160-5692-3	LEAD-212	3/4/2014	0.47	Yes	Y				0.00966	0.00966	pci/g
CC-C-043-10-12-20140220	160-5692-3	URANIUM	3/4/2014	0.547	Yes	Y				0.141	0.141	pci/g
CC-C-043-10-12-20140220	160-5692-3	BISMUTH-214	3/4/2014	0.327	Yes	Y				0.0126	0.0126	pci/g
CC-C-043-10-12-20140220	160-5692-3	ACTINIUM 228	3/4/2014	0.44	Yes	Y				0.0235	0.0235	pci/g
CC-C-043-10-12-20140220	160-5692-3	LEAD-210	3/4/2014	0.306	Yes	Y				0.128	0.128	pci/g
CC-C-044-6-8-20140220	160-5692-4	POTASSIUM-40	3/4/2014	4.64	Yes	Y				0.0703	0.0703	pci/g
CC-C-044-6-8-20140220	160-5692-4	ACTINIUM 228	3/4/2014	0.157	Yes	Y				0.0158	0.0158	pci/g
CC-C-044-6-8-20140220	160-5692-4	BISMUTH-212	3/4/2014	0.19	Yes	Y				0.0647	0.0647	pci/g
CC-C-044-6-8-20140220	160-5692-4	BISMUTH-214	3/4/2014	0.136	Yes	Y				0.0125	0.0125	pci/g
CC-C-044-6-8-20140220	160-5692-4	LEAD-210	3/4/2014	0.165	Yes	Y				0.119	0.119	pci/g
CC-C-044-6-8-20140220	160-5692-4	LEAD-214	3/4/2014	0.141	Yes	Y				0.0119	0.0119	pci/g
CC-C-044-6-8-20140220	160-5692-4	THORIUM-234	3/4/2014	0.201	Yes	Y				0.118	0.118	pci/g
CC-C-044-6-8-20140220	160-5692-4	THALLIUM-208	3/4/2014	0.0507	Yes	Y				0.00612	0.00612	pci/g
CC-C-044-6-8-20140220	160-5692-4	URANIUM	3/4/2014	0.201	Yes	Y				0.118	0.118	pci/g
CC-C-044-6-8-20140220	160-5692-4	Protactinium 234	3/4/2014	0.769	Yes	Y	U		U	0.840	0.840	pci/g
CC-C-044-6-8-20140220	160-5692-4	RADIUM-226	3/4/2014	0.409	Yes	Y				0.123	0.123	pci/g
CC-C-044-6-8-20140220	160-5692-4	RADIUM-228	3/4/2014	0.157	Yes	Y				0.0158	0.0158	pci/g
CC-C-044-6-8-20140220	160-5692-4	PROTACTINIUM 231	3/4/2014	-0.0768	Yes	Y	U		U	0.162	0.162	pci/g
CC-C-044-6-8-20140220	160-5692-4	URANIUM-235	3/4/2014	0.0247	Yes	Y				0.0236	0.0236	pci/g
CC-C-044-6-8-20140220	160-5692-4	LEAD-212	3/4/2014	0.143	Yes	Y				0.00913	0.00913	pci/g
CC-C-045-6-8-20140220	160-5692-6	LEAD-214	3/4/2014	0.384	Yes	Y				0.0140	0.0140	pci/g

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
CC-C-045-6-8-20140220	160-5692-6	POTASSIUM-40	3/4/2014	8.59	Yes	Y				0.0752	0.0752	pci/g
CC-C-045-6-8-20140220	160-5692-6	PROTACTINIUM 231	3/4/2014	0.0966	Yes	Y	U		U	0.138	0.138	pci/g
CC-C-045-6-8-20140220	160-5692-6	RADIUM-226	3/4/2014	0.897	Yes	Y				0.128	0.128	pci/g
CC-C-045-6-8-20140220	160-5692-6	ACTINIUM 228	3/4/2014	0.445	Yes	Y				0.0201	0.0201	pci/g
CC-C-045-6-8-20140220	160-5692-6	THALLIUM-208	3/4/2014	0.152	Yes	Y				0.00708	0.00708	pci/g
CC-C-045-6-8-20140220	160-5692-6	RADIUM-228	3/4/2014	0.445	Yes	Y				0.0201	0.0201	pci/g
CC-C-045-6-8-20140220	160-5692-6	Protactinium 234	3/4/2014	1.46	Yes	Y				0.691	0.691	pci/g
CC-C-045-6-8-20140220	160-5692-6	THORIUM-234	3/4/2014	0.631	Yes	Y				0.155	0.155	pci/g
CC-C-045-6-8-20140220	160-5692-6	LEAD-210	3/4/2014	0.392	Yes	Y				0.147	0.147	pci/g
CC-C-045-6-8-20140220	160-5692-6	BISMUTH-212	3/4/2014	0.494	Yes	Y				0.0637	0.0637	pci/g
CC-C-045-6-8-20140220	160-5692-6	URANIUM-235	3/4/2014	0.038	Yes	Y				0.0344	0.0344	pci/g
CC-C-045-6-8-20140220	160-5692-6	URANIUM	3/4/2014	0.631	Yes	Y				0.155	0.155	pci/g
CC-C-045-6-8-20140220	160-5692-6	BISMUTH-214	3/4/2014	0.342	Yes	Y				0.0136	0.0136	pci/g
CC-C-045-6-8-20140220	160-5692-6	LEAD-212	3/4/2014	0.489	Yes	Y				0.00978	0.00978	pci/g
CC-C-046-6-8-20140220	160-5692-8	LEAD-210	3/4/2014	0.506	Yes	Y				0.159	0.159	pci/g
CC-C-046-6-8-20140220	160-5692-8	BISMUTH-214	3/4/2014	0.485	Yes	Y				0.0171	0.0171	pci/g
CC-C-046-6-8-20140220	160-5692-8	BISMUTH-212	3/4/2014	0.596	Yes	Y				0.0899	0.0899	pci/g
CC-C-046-6-8-20140220	160-5692-8	ACTINIUM 228	3/4/2014	0.538	Yes	Y				0.0303	0.0303	pci/g
CC-C-046-6-8-20140220	160-5692-8	LEAD-214	3/4/2014	0.539	Yes	Y				0.0177	0.0177	pci/g
CC-C-046-6-8-20140220	160-5692-8	POTASSIUM-40	3/4/2014	8.05	Yes	Y				0.0981	0.0981	pci/g
CC-C-046-6-8-20140220	160-5692-8	PROTACTINIUM 231	3/4/2014	0.257	Yes	Y	U		U	0.260	0.260	pci/g
CC-C-046-6-8-20140220	160-5692-8	LEAD-212	3/4/2014	0.581	Yes	Y				0.0141	0.0141	pci/g
CC-C-046-6-8-20140220	160-5692-8	RADIUM-226	3/4/2014	1.15	Yes	Y				0.191	0.191	pci/g
CC-C-046-6-8-20140220	160-5692-8	URANIUM-235	3/4/2014	0.0404	Yes	Y	U		U	0.0430	0.0430	pci/g
CC-C-046-6-8-20140220	160-5692-8	URANIUM	3/4/2014	0.61	Yes	Y				0.196	0.196	pci/g

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
CC-C-046-6-8-20140220	160-5692-8	THORIUM-234	3/4/2014	0.61	Yes	Y				0.196	0.196	pci/g
CC-C-046-6-8-20140220	160-5692-8	THALLIUM-208	3/4/2014	0.188	Yes	Y				0.00921	0.00921	pci/g
CC-C-046-6-8-20140220	160-5692-8	RADIUM-228	3/4/2014	0.538	Yes	Y				0.0303	0.0303	pci/g
CC-C-046-6-8-20140220	160-5692-8	Protactinium 234	3/4/2014	1.6	Yes	Y				1.02	1.02	pci/g
FB027-20140220	160-5692-5	BISMUTH-214	2/28/2014	3.86	Yes	Y	U		U	9.58	9.58	pci/l
FB027-20140220	160-5692-5	POTASSIUM-40	2/28/2014	-41.1	Yes	Y	U		U	61.3	61.3	pci/l
FB027-20140220	160-5692-5	BISMUTH-212	2/28/2014	1.93	Yes	Y	U		U	48.0	48.0	pci/l
FB027-20140220	160-5692-5	CESIUM-137	2/28/2014	-0.34	Yes	Y	U		U	4.07	4.07	pci/l
FB027-20140220	160-5692-5	LEAD-212	2/28/2014	0.274	Yes	Y	U		U	6.79	6.79	pci/l
FB027-20140220	160-5692-5	LEAD-214	2/28/2014	3.67	Yes	Y	U		U	9.43	9.43	pci/l
FB027-20140220	160-5692-5	PROTACTINIUM 231	2/28/2014	-24.5	Yes	Y	U		U	109	109	pci/l
FB027-20140220	160-5692-5	Protactinium 234	2/28/2014	-220	Yes	Y	U		U	620	620	pci/l
FB027-20140220	160-5692-5	ACTINIUM 228	2/28/2014	7.2	Yes	Y	U		U	12.9	12.9	pci/l
LT-C-048-2-4-20140220	160-5692-7	THORIUM-234	3/4/2014	0.356	Yes	Y				0.144	0.144	pci/g
LT-C-048-2-4-20140220	160-5692-7	BISMUTH-214	3/4/2014	0.324	Yes	Y				0.0141	0.0141	pci/g
LT-C-048-2-4-20140220	160-5692-7	URANIUM-235	3/4/2014	0.0176	Yes	Y	U		U	0.0315	0.0315	pci/g
LT-C-048-2-4-20140220	160-5692-7	URANIUM	3/4/2014	0.356	Yes	Y				0.144	0.144	pci/g
LT-C-048-2-4-20140220	160-5692-7	THALLIUM-208	3/4/2014	0.118	Yes	Y				0.00629	0.00629	pci/g
LT-C-048-2-4-20140220	160-5692-7	RADIUM-226	3/4/2014	0.922	Yes	Y				0.140	0.140	pci/g
LT-C-048-2-4-20140220	160-5692-7	Protactinium 234	3/4/2014	0.62	Yes	Y	U		U	1.09	1.09	pci/g
LT-C-048-2-4-20140220	160-5692-7	PROTACTINIUM 231	3/4/2014	-0.111	Yes	Y	U		U	0.181	0.181	pci/g
LT-C-048-2-4-20140220	160-5692-7	POTASSIUM-40	3/4/2014	11	Yes	Y				0.0706	0.0706	pci/g
LT-C-048-2-4-20140220	160-5692-7	LEAD-214	3/4/2014	0.366	Yes	Y				0.0139	0.0139	pci/g
LT-C-048-2-4-20140220	160-5692-7	RADIUM-228	3/4/2014	0.332	Yes	Y				0.0238	0.0238	pci/g
LT-C-048-2-4-20140220	160-5692-7	LEAD-210	3/4/2014	0.296	Yes	Y				0.139	0.139	pci/g

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-C-048-2-4-20140220	160-5692-7	BISMUTH-212	3/4/2014	0.432	Yes	Y				0.0941	0.0941	pci/g
LT-C-048-2-4-20140220	160-5692-7	ACTINIUM 228	3/4/2014	0.332	Yes	Y				0.0238	0.0238	pci/g
LT-C-048-2-4-20140220	160-5692-7	LEAD-212	3/4/2014	0.343	Yes	Y				0.00983	0.00983	pci/g
LT-C-049-2-4-20140220	160-5692-9	LEAD-214	3/5/2014	0.511	Yes	Y				0.0139	0.0139	pci/g
LT-C-049-2-4-20140220	160-5692-9	BISMUTH-212	3/5/2014	0.617	Yes	Y				0.0878	0.0878	pci/g
LT-C-049-2-4-20140220	160-5692-9	BISMUTH-214	3/5/2014	0.44	Yes	Y				0.0131	0.0131	pci/g
LT-C-049-2-4-20140220	160-5692-9	LEAD-212	3/5/2014	0.596	Yes	Y				0.0104	0.0104	pci/g
LT-C-049-2-4-20140220	160-5692-9	URANIUM	3/5/2014	0.587	Yes	Y				0.166	0.166	pci/g
LT-C-049-2-4-20140220	160-5692-9	POTASSIUM-40	3/5/2014	7.41	Yes	Y				0.0749	0.0749	pci/g
LT-C-049-2-4-20140220	160-5692-9	PROTACTINIUM 231	3/5/2014	0.0651	Yes	Y	U		U	0.153	0.153	pci/g
LT-C-049-2-4-20140220	160-5692-9	Protactinium 234	3/5/2014	1.23	Yes	Y				0.620	0.620	pci/g
LT-C-049-2-4-20140220	160-5692-9	RADIUM-226	3/5/2014	1.06	Yes	Y				0.137	0.137	pci/g
LT-C-049-2-4-20140220	160-5692-9	RADIUM-228	3/5/2014	0.548	Yes	Y				0.0216	0.0216	pci/g
LT-C-049-2-4-20140220	160-5692-9	ACTINIUM 228	3/5/2014	0.548	Yes	Y				0.0216	0.0216	pci/g
LT-C-049-2-4-20140220	160-5692-9	THALLIUM-208	3/5/2014	0.179	Yes	Y				0.00699	0.00699	pci/g
LT-C-049-2-4-20140220	160-5692-9	THORIUM-234	3/5/2014	0.587	Yes	Y				0.166	0.166	pci/g
LT-C-049-2-4-20140220	160-5692-9	URANIUM-235	3/5/2014	0.065	Yes	Y				0.0358	0.0358	pci/g
LT-C-049-2-4-20140220	160-5692-9	LEAD-210	3/5/2014	0.5	Yes	Y				0.156	0.156	pci/g
LT-XC-020-6-8-20140220	160-5692-1	ACTINIUM 228	3/4/2014	0.557	Yes	Y				0.0242	0.0242	pci/g
LT-XC-020-6-8-20140220	160-5692-1	BISMUTH-212	3/4/2014	0.648	Yes	Y				0.0850	0.0850	pci/g
LT-XC-020-6-8-20140220	160-5692-1	BISMUTH-214	3/4/2014	0.379	Yes	Y				0.0125	0.0125	pci/g
LT-XC-020-6-8-20140220	160-5692-1	LEAD-210	3/4/2014	0.434	Yes	Y				0.138	0.138	pci/g
LT-XC-020-6-8-20140220	160-5692-1	LEAD-212	3/4/2014	0.595	Yes	Y				0.0101	0.0101	pci/g
LT-XC-020-6-8-20140220	160-5692-1	LEAD-214	3/4/2014	0.412	Yes	Y				0.0138	0.0138	pci/g
LT-XC-020-6-8-20140220	160-5692-1	URANIUM	3/4/2014	0.391	Yes	Y				0.146	0.146	pci/g

Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-XC-020-6-8-20140220	160-5692-1	PROTACTINIUM 231	3/4/2014	-0.26	Yes	Y	U		U	0.199	0.199	pci/g
LT-XC-020-6-8-20140220	160-5692-1	URANIUM-235	3/4/2014	0.0486	Yes	Y				0.0394	0.0394	pci/g
LT-XC-020-6-8-20140220	160-5692-1	THORIUM-234	3/4/2014	0.391	Yes	Y				0.146	0.146	pci/g
LT-XC-020-6-8-20140220	160-5692-1	RADIUM-228	3/4/2014	0.557	Yes	Y				0.0242	0.0242	pci/g
LT-XC-020-6-8-20140220	160-5692-1	Protactinium 234	3/4/2014	1.69	Yes	Y				0.706	0.706	pci/g
LT-XC-020-6-8-20140220	160-5692-1	POTASSIUM-40	3/4/2014	11.5	Yes	Y				0.0712	0.0712	pci/g
LT-XC-020-6-8-20140220	160-5692-1	THALLIUM-208	3/4/2014	0.174	Yes	Y				0.00777	0.00777	pci/g
LT-XC-020-6-8-20140220	160-5692-1	RADIUM-226	3/4/2014	0.895	Yes	Y				0.151	0.151	pci/g
LT-XC-020-6-8-20140220LR	160-5692-1LR	CESIUM-137	3/4/2014	-0.003057	Yes	Y	U		U	0.00790	0.00790	pci/g
LT-XC-020-6-8-20140220LR	160-5692-1LR	COBALT-60	3/4/2014	-0.000159	Yes	Y	U		U	0.00827	0.00827	pci/g
LT-XC-020-6-8-20140220LR	160-5692-1LR	BISMUTH-214	3/4/2014	0.3664	Yes	Y				0.0131	0.0131	pci/g
LT-XC-020-6-8-20140220LR	160-5692-1LR	PROTACTINIUM 231	3/4/2014	0.06257	Yes	Y	UF		U	0.138	0.138	pci/g
LT-XC-020-6-8-20140220LR	160-5692-1LR	BISMUTH-212	3/4/2014	0.5963	Yes	Y				0.0776	0.0776	pci/g
LT-XC-020-6-8-20140220LR	160-5692-1LR	RADIUM-228	3/4/2014	0.5494	Yes	Y				0.0229	0.0229	pci/g
LT-XC-020-6-8-20140220LR	160-5692-1LR	AMERICIUM-241	3/4/2014	0.003479	Yes	Y	U		U	0.0182	0.0182	pci/g
LT-XC-020-6-8-20140220LR	160-5692-1LR	ACTINIUM 228	3/4/2014	0.5494	Yes	Y				0.0229	0.0229	pci/g
LT-XC-020-6-8-20140220LR	160-5692-1LR	LEAD-210	3/4/2014	0.4502	Yes	Y				0.147	0.147	pci/g
LT-XC-020-6-8-20140220LR	160-5692-1LR	LEAD-212	3/4/2014	0.5488	Yes	Y				0.0127	0.0127	pci/g
LT-XC-020-6-8-20140220LR	160-5692-1LR	POTASSIUM-40	3/4/2014	11.91	Yes	Y				0.0748	0.0748	pci/g
LT-XC-020-6-8-20140220LR	160-5692-1LR	Protactinium 234	3/4/2014	1.423	Yes	Y				0.749	0.749	pci/g
LT-XC-020-6-8-20140220LR	160-5692-1LR	RADIUM-226	3/4/2014	0.8809	Yes	Y				0.138	0.138	pci/g
LT-XC-020-6-8-20140220LR	160-5692-1LR	THALLIUM-208	3/4/2014	0.1777	Yes	Y				0.00598	0.00598	pci/g
LT-XC-020-6-8-20140220LR	160-5692-1LR	LEAD-214	3/4/2014	0.4179	Yes	Y				0.0123	0.0123	pci/g
LT-XC-020-6-8-20140220LR	160-5692-1LR	URANIUM-235	3/4/2014	0.03794	Yes	Y				0.0322	0.0322	pci/g
LT-XC-020-6-8-20140220LR	160-5692-1LR	THORIUM-234	3/4/2014	0.4162	Yes	Y				0.157	0.157	pci/g

SDG: 16056921

Analytical Method		E901.1										
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-XC-020-6-8-20140220LR	160-5692-1LR	URANIUM	3/4/2014	0.4162	Yes	Y				0.157	0.157	pci/g

Analytical Method		E903.0										
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601078681A	1601078681A	RADIUM-226	2/28/2014	0.1267	Yes	Y	U		U	0.180	0.180	pci/l
FB027-20140220	160-5692-5	RADIUM-226	2/28/2014	-0.0255	Yes	Y	U		U	0.202	0.202	pci/l

Analytical Method		E904.0										
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601078671A	1601078671A	RADIUM-228	3/3/2014	0.02661	Yes	Y	U		U	0.286	0.286	pci/l
FB027-20140220	160-5692-5	RADIUM-228	3/3/2014	-0.102	Yes	Y	U		U	0.366	0.366	pci/l

Analytical Method A-01-R

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601080191A	1601080191A	THORIUM-228	3/5/2014	-0.04209	Yes	Y	U		U	0.574	0.574	pci/l
1601080191A	1601080191A	THORIUM-230	3/5/2014	0.006558	Yes	Y	U		U	0.341	0.341	pci/l
1601080191A	1601080191A	THORIUM	3/5/2014	0.1606	Yes	Y	U		U	0.339	0.339	pci/l
1601080211A	1601080211A	URANIUM	3/5/2014	0.009675	Yes	Y	U		U	0.126	0.126	pci/l
1601080211A	1601080211A	URANIUM-235	3/5/2014	-0.00517	Yes	Y	U		U	0.126	0.126	pci/l
1601080211A	1601080211A	URANIUM 233 AND 234	3/5/2014	0.07756	Yes	Y	U		U	0.164	0.164	pci/l
1601080241A	1601080241A	THORIUM	3/6/2014	0	Yes	Y	U		U	0.0298	0.0298	pci/g
1601080241A	1601080241A	THORIUM-228	3/6/2014	0.03541	Yes	Y	U		U	0.0860	0.0860	pci/g
1601080241A	1601080241A	THORIUM-230	3/6/2014	0.009356	Yes	Y	U		U	0.0455	0.0455	pci/g
1601091971A	1601091971A	URANIUM-235	3/12/2014	-0.002343	Yes	Y	U		U	0.0569	0.0569	pci/g
1601091971A	1601091971A	URANIUM 233 AND 234	3/12/2014	0.02636	Yes	Y	U		U	0.0522	0.0522	pci/g
1601091971A	1601091971A	URANIUM	3/12/2014	0.01816	Yes	Y	U		U	0.0456	0.0456	pci/g
DUP028-20140224	160-5697-4	THORIUM-228	3/6/2014	0.472	Yes	Y				0.105	0.105	pci/g
DUP028-20140224	160-5697-4	THORIUM	3/6/2014	0.576	Yes	Y				0.0411	0.0411	pci/g
DUP028-20140224	160-5697-4	THORIUM-230	3/6/2014	0.561	Yes	Y				0.0628	0.0628	pci/g
DUP028-20140224	160-5697-4	URANIUM	3/12/2014	0.614	Yes	Y				0.0483	0.0483	pci/g
DUP028-20140224	160-5697-4	URANIUM 233 AND 234	3/12/2014	0.59	Yes	Y				0.0786	0.0786	pci/g
DUP028-20140224	160-5697-4	URANIUM-235	3/12/2014	0.0455	Yes	Y	U		U	0.0753	0.0753	pci/g
FB029-20140224	160-5697-5	URANIUM-235	3/5/2014	-0.01	Yes	Y	U		U	0.139	0.139	pci/l
FB029-20140224	160-5697-5	URANIUM 233 AND 234	3/5/2014	-0.0201	Yes	Y	U		U	0.139	0.139	pci/l
FB029-20140224	160-5697-5	URANIUM	3/5/2014	0.0643	Yes	Y				0.0643	0.0643	pci/l
FB029-20140224	160-5697-5	THORIUM-230	3/5/2014	0.128	Yes	Y	U		U	0.132	0.132	pci/l
FB029-20140224	160-5697-5	THORIUM-228	3/5/2014	0.0882	Yes	Y	U		U	0.105	0.105	pci/l
FB029-20140224	160-5697-5	THORIUM	3/5/2014	-0.0282	Yes	Y	U		U	0.161	0.161	pci/l
LT-C-060-6-8-20140224	160-5697-1	THORIUM-228	3/6/2014	0.388	Yes	Y				0.109	0.109	pci/g

Analytical Method A-01-R

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-C-060-6-8-20140224	160-5697-1	THORIUM-230	3/6/2014	0.273	Yes	Y				0.0372	0.0372	pci/g
LT-C-060-6-8-20140224	160-5697-1	THORIUM	3/6/2014	0.394	Yes	Y				0.0370	0.0370	pci/g
LT-C-060-6-8-20140224	160-5697-1	URANIUM-235	3/12/2014	0.0351	Yes	Y	U		U	0.0694	0.0694	pci/g
LT-C-060-6-8-20140224	160-5697-1	URANIUM 233 AND 234	3/12/2014	0.581	Yes	Y				0.0695	0.0695	pci/g
LT-C-060-6-8-20140224	160-5697-1	URANIUM	3/12/2014	0.418	Yes	Y				0.0322	0.0322	pci/g
LT-G-028-8-10-20140224	160-5697-2	THORIUM-228	3/6/2014	1.01	Yes	Y				0.118	0.118	pci/g
LT-G-028-8-10-20140224	160-5697-2	THORIUM-230	3/6/2014	0.953	Yes	Y				0.0682	0.0682	pci/g
LT-G-028-8-10-20140224	160-5697-2	THORIUM	3/6/2014	0.805	Yes	Y				0.0679	0.0679	pci/g
LT-G-028-8-10-20140224	160-5697-2	URANIUM-235	3/12/2014	0.0398	Yes	Y				0.0398	0.0398	pci/g
LT-G-028-8-10-20140224	160-5697-2	URANIUM 233 AND 234	3/12/2014	0.776	Yes	Y				0.0725	0.0725	pci/g
LT-G-028-8-10-20140224	160-5697-2	URANIUM	3/12/2014	0.72	Yes	Y				0.0756	0.0756	pci/g
LT-G-029-4-6-20140224	160-5697-3	THORIUM-230	3/6/2014	0.81	Yes	Y				0.0658	0.0658	pci/g
LT-G-029-4-6-20140224	160-5697-3	THORIUM	3/6/2014	0.763	Yes	Y				0.0378	0.0378	pci/g
LT-G-029-4-6-20140224	160-5697-3	THORIUM-228	3/6/2014	0.705	Yes	Y				0.121	0.121	pci/g
LT-G-029-4-6-20140224	160-5697-3	URANIUM 233 AND 234	3/12/2014	0.407	Yes	Y				0.0573	0.0573	pci/g
LT-G-029-4-6-20140224	160-5697-3	URANIUM	3/12/2014	0.507	Yes	Y				0.0572	0.0572	pci/g
LT-G-029-4-6-20140224	160-5697-3	URANIUM-235	3/12/2014	-0.0047	Yes	Y	U		U	0.0651	0.0651	pci/g

Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601078771A	1601078771A	AMERICIUM-241	2/28/2014	6.511	Yes	Y				5.57	5.57	pci/l
1601078771A	1601078771A	BISMUTH-214	2/28/2014	2.846	Yes	Y	U		U	10.3	10.3	pci/l
1601078771A	1601078771A	CESIUM-137	2/28/2014	1.815	Yes	Y	U		U	3.47	3.47	pci/l
1601078771A	1601078771A	ACTINIUM 228	2/28/2014	9.046	Yes	Y	U		U	11.2	11.2	pci/l
1601078771A	1601078771A	BISMUTH-212	2/28/2014	0	Yes	Y	U		U	43.0	43.0	pci/l

Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601078771A	1601078771A	COBALT-60	2/28/2014	-0.1425	Yes	Y	U		U	3.89	3.89	pci/l
1601078771A	1601078771A	LEAD-212	2/28/2014	-1.979	Yes	Y	U		U	7.23	7.23	pci/l
1601078771A	1601078771A	LEAD-214	2/28/2014	-1.771	Yes	Y	U		U	9.05	9.05	pci/l
1601078771A	1601078771A	POTASSIUM-40	2/28/2014	-51.2	Yes	Y	U		U	61.2	61.2	pci/l
1601078771A	1601078771A	Protactinium 234	2/28/2014	45	Yes	Y	U		U	486	486	pci/l
1601078771A	1601078771A	PROTACTINIUM 231	2/28/2014	8.099	Yes	Y	U		U	110	110	pci/l
1601079551A	1601079551A	COBALT-60	3/4/2014	0.0001524	Yes	Y	U		U	0.00380	0.00380	pci/g
1601079551A	1601079551A	LEAD-212	3/4/2014	0.002962	Yes	Y	U		U	0.00703	0.00703	pci/g
1601079551A	1601079551A	LEAD-210	3/4/2014	0.03886	Yes	Y	U		U	0.0865	0.0865	pci/g
1601079551A	1601079551A	POTASSIUM-40	3/4/2014	0	Yes	Y	U		U	0.0805	0.0805	pci/g
1601079551A	1601079551A	URANIUM-235	3/4/2014	0.01139	Yes	Y	U		U	0.0177	0.0177	pci/g
1601079551A	1601079551A	PROTACTINIUM 231	3/4/2014	0.01801	Yes	Y	U		U	0.100	0.100	pci/g
1601079551A	1601079551A	RADIUM-226	3/4/2014	-0.00556	Yes	Y	U		U	0.0812	0.0812	pci/g
1601079551A	1601079551A	Protactinium 234	3/4/2014	-0.13	Yes	Y	U		U	0.764	0.764	pci/g
1601079551A	1601079551A	THORIUM-234	3/4/2014	0.03113	Yes	Y	U		U	0.0779	0.0779	pci/g
1601079551A	1601079551A	RADIUM-228	3/4/2014	0.009706	Yes	Y	U		U	0.0166	0.0166	pci/g
1601079551A	1601079551A	CESIUM-137	3/4/2014	0.000407	Yes	Y	U		U	0.00381	0.00381	pci/g
1601079551A	1601079551A	LEAD-214	3/4/2014	0.005871	Yes	Y	U		U	0.00780	0.00780	pci/g
1601079551A	1601079551A	BISMUTH-214	3/4/2014	0.003687	Yes	Y	U		U	0.0113	0.0113	pci/g
1601079551A	1601079551A	URANIUM	3/4/2014	0.03113	Yes	Y	U		U	0.0779	0.0779	pci/g
1601079551A	1601079551A	BISMUTH-212	3/4/2014	0.01583	Yes	Y	U		U	0.0505	0.0505	pci/g
1601079551A	1601079551A	AMERICIUM-241	3/4/2014	0.001496	Yes	Y	U		U	0.00603	0.00603	pci/g
1601079551A	1601079551A	THALLIUM-208	3/4/2014	0.003029	Yes	Y	U		U	0.00480	0.00480	pci/g
1601079551A	1601079551A	ACTINIUM 228	3/4/2014	0.009706	Yes	Y	U		U	0.0166	0.0166	pci/g
DUP028-20140224	160-5697-4	THORIUM-234	3/5/2014	0.301	Yes	Y				0.129	0.129	pci/g

Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
DUP028-20140224	160-5697-4	URANIUM	3/5/2014	0.301	Yes	Y				0.129	0.129	pci/g
DUP028-20140224	160-5697-4	LEAD-212	3/5/2014	0.306	Yes	Y				0.0109	0.0109	pci/g
DUP028-20140224	160-5697-4	LEAD-214	3/5/2014	0.309	Yes	Y				0.0132	0.0132	pci/g
DUP028-20140224	160-5697-4	URANIUM-235	3/5/2014	0.05	Yes	Y				0.0344	0.0344	pci/g
DUP028-20140224	160-5697-4	POTASSIUM-40	3/5/2014	7.9	Yes	Y				0.0872	0.0872	pci/g
DUP028-20140224	160-5697-4	PROTACTINIUM 231	3/5/2014	0.157	Yes	Y	U		U	0.194	0.194	pci/g
DUP028-20140224	160-5697-4	Protactinium 234	3/5/2014	0.93	Yes	Y				0.734	0.734	pci/g
DUP028-20140224	160-5697-4	RADIUM-226	3/5/2014	0.727	Yes	Y				0.146	0.146	pci/g
DUP028-20140224	160-5697-4	RADIUM-228	3/5/2014	0.296	Yes	Y				0.0238	0.0238	pci/g
DUP028-20140224	160-5697-4	ACTINIUM 228	3/5/2014	0.296	Yes	Y				0.0238	0.0238	pci/g
DUP028-20140224	160-5697-4	LEAD-210	3/5/2014	0.326	Yes	Y				0.133	0.133	pci/g
DUP028-20140224	160-5697-4	BISMUTH-214	3/5/2014	0.274	Yes	Y				0.0147	0.0147	pci/g
DUP028-20140224	160-5697-4	BISMUTH-212	3/5/2014	0.302	Yes	Y				0.0717	0.0717	pci/g
DUP028-20140224	160-5697-4	THALLIUM-208	3/5/2014	0.106	Yes	Y				0.00760	0.00760	pci/g
FB029-20140224	160-5697-5	Protactinium 234	2/28/2014	221	Yes	Y	U		U	504	504	pci/l
FB029-20140224	160-5697-5	PROTACTINIUM 231	2/28/2014	24.5	Yes	Y	U		U	103	103	pci/l
FB029-20140224	160-5697-5	LEAD-214	2/28/2014	-3.34	Yes	Y	U		U	11.3	11.3	pci/l
FB029-20140224	160-5697-5	POTASSIUM-40	2/28/2014	44.6	Yes	Y	U		U	71.3	71.3	pci/l
FB029-20140224	160-5697-5	ACTINIUM 228	2/28/2014	11.5	Yes	Y	U		U	13.4	13.4	pci/l
FB029-20140224	160-5697-5	BISMUTH-214	2/28/2014	9.64	Yes	Y	U		U	10.3	10.3	pci/l
FB029-20140224	160-5697-5	LEAD-212	2/28/2014	1.35	Yes	Y	U		U	7.85	7.85	pci/l
FB029-20140224	160-5697-5	CESIUM-137	2/28/2014	0.118	Yes	Y	U		U	4.29	4.29	pci/l
FB029-20140224	160-5697-5	BISMUTH-212	2/28/2014	30.4	Yes	Y	U		U	48.1	48.1	pci/l
LT-C-060-6-8-20140224	160-5697-1	RADIUM-226	3/5/2014	0.701	Yes	Y				0.136	0.136	pci/g
LT-C-060-6-8-20140224	160-5697-1	BISMUTH-214	3/5/2014	0.269	Yes	Y				0.0129	0.0129	pci/g

Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-C-060-6-8-20140224	160-5697-1	URANIUM-235	3/5/2014	0.0542	Yes	Y				0.0304	0.0304	pci/g
LT-C-060-6-8-20140224	160-5697-1	URANIUM	3/5/2014	0.356	Yes	Y				0.147	0.147	pci/g
LT-C-060-6-8-20140224	160-5697-1	LEAD-214	3/5/2014	0.309	Yes	Y				0.0134	0.0134	pci/g
LT-C-060-6-8-20140224	160-5697-1	LEAD-212	3/5/2014	0.31	Yes	Y				0.0113	0.0113	pci/g
LT-C-060-6-8-20140224	160-5697-1	PROTACTINIUM 231	3/5/2014	-0.101	Yes	Y	U		U	0.168	0.168	pci/g
LT-C-060-6-8-20140224	160-5697-1	LEAD-210	3/5/2014	0.284	Yes	Y				0.136	0.136	pci/g
LT-C-060-6-8-20140224	160-5697-1	BISMUTH-212	3/5/2014	0.366	Yes	Y				0.0784	0.0784	pci/g
LT-C-060-6-8-20140224	160-5697-1	THORIUM-234	3/5/2014	0.356	Yes	Y				0.147	0.147	pci/g
LT-C-060-6-8-20140224	160-5697-1	THALLIUM-208	3/5/2014	0.108	Yes	Y				0.00664	0.00664	pci/g
LT-C-060-6-8-20140224	160-5697-1	RADIUM-228	3/5/2014	0.355	Yes	Y				0.0227	0.0227	pci/g
LT-C-060-6-8-20140224	160-5697-1	ACTINIUM 228	3/5/2014	0.355	Yes	Y				0.0227	0.0227	pci/g
LT-C-060-6-8-20140224	160-5697-1	Protactinium 234	3/5/2014	1.24	Yes	Y				0.720	0.720	pci/g
LT-C-060-6-8-20140224	160-5697-1	POTASSIUM-40	3/5/2014	12.1	Yes	Y				0.0741	0.0741	pci/g
LT-G-028-8-10-20140224	160-5697-2	BISMUTH-212	3/7/2014	1.51	Yes	Y				0.215	0.215	pci/g
LT-G-028-8-10-20140224	160-5697-2	ACTINIUM 228	3/7/2014	1.39	Yes	Y				0.0629	0.0629	pci/g
LT-G-028-8-10-20140224	160-5697-2	BISMUTH-214	3/7/2014	1.04	Yes	Y				0.0389	0.0389	pci/g
LT-G-028-8-10-20140224	160-5697-2	LEAD-210	3/7/2014	1.04	Yes	Y				0.319	0.319	pci/g
LT-G-028-8-10-20140224	160-5697-2	LEAD-212	3/7/2014	1.41	Yes	Y				0.0292	0.0292	pci/g
LT-G-028-8-10-20140224	160-5697-2	LEAD-214	3/7/2014	1.16	Yes	Y				0.0351	0.0351	pci/g
LT-G-028-8-10-20140224	160-5697-2	POTASSIUM-40	3/7/2014	20.7	Yes	Y				0.188	0.188	pci/g
LT-G-028-8-10-20140224	160-5697-2	PROTACTINIUM 231	3/7/2014	-0.521	Yes	Y	U		U	0.535	0.535	pci/g
LT-G-028-8-10-20140224	160-5697-2	Protactinium 234	3/7/2014	3.24	Yes	Y				2.19	2.19	pci/g
LT-G-028-8-10-20140224	160-5697-2	RADIUM-226	3/7/2014	2.61	Yes	Y				0.350	0.350	pci/g
LT-G-028-8-10-20140224	160-5697-2	RADIUM-228	3/7/2014	1.39	Yes	Y				0.0629	0.0629	pci/g
LT-G-028-8-10-20140224	160-5697-2	THALLIUM-208	3/7/2014	0.476	Yes	Y				0.0214	0.0214	pci/g

Analytical Method E901.1												
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-G-028-8-10-20140224	160-5697-2	THORIUM-234	3/7/2014	1.48	Yes	Y				0.372	0.372	pci/g
LT-G-028-8-10-20140224	160-5697-2	URANIUM-235	3/7/2014	0.109	Yes	Y				0.0799	0.0799	pci/g
LT-G-028-8-10-20140224	160-5697-2	URANIUM	3/7/2014	1.48	Yes	Y				0.372	0.372	pci/g
LT-G-029-4-6-20140224	160-5697-3	URANIUM-235	3/7/2014	0.0595	Yes	Y				0.0443	0.0443	pci/g
LT-G-029-4-6-20140224	160-5697-3	POTASSIUM-40	3/7/2014	13.1	Yes	Y				0.110	0.110	pci/g
LT-G-029-4-6-20140224	160-5697-3	URANIUM	3/7/2014	0.959	Yes	Y				0.221	0.221	pci/g
LT-G-029-4-6-20140224	160-5697-3	THALLIUM-208	3/7/2014	0.296	Yes	Y				0.00995	0.00995	pci/g
LT-G-029-4-6-20140224	160-5697-3	RADIUM-228	3/7/2014	0.918	Yes	Y				0.0336	0.0336	pci/g
LT-G-029-4-6-20140224	160-5697-3	RADIUM-226	3/7/2014	1.94	Yes	Y				0.210	0.210	pci/g
LT-G-029-4-6-20140224	160-5697-3	THORIUM-234	3/7/2014	0.959	Yes	Y				0.221	0.221	pci/g
LT-G-029-4-6-20140224	160-5697-3	PROTACTINIUM 231	3/7/2014	-0.239	Yes	Y	U		U	0.274	0.274	pci/g
LT-G-029-4-6-20140224	160-5697-3	LEAD-214	3/7/2014	0.847	Yes	Y				0.0205	0.0205	pci/g
LT-G-029-4-6-20140224	160-5697-3	LEAD-212	3/7/2014	0.927	Yes	Y				0.0183	0.0183	pci/g
LT-G-029-4-6-20140224	160-5697-3	LEAD-210	3/7/2014	0.857	Yes	Y				0.202	0.202	pci/g
LT-G-029-4-6-20140224	160-5697-3	BISMUTH-214	3/7/2014	0.737	Yes	Y				0.0183	0.0183	pci/g
LT-G-029-4-6-20140224	160-5697-3	BISMUTH-212	3/7/2014	1.01	Yes	Y				0.125	0.125	pci/g
LT-G-029-4-6-20140224	160-5697-3	ACTINIUM 228	3/7/2014	0.918	Yes	Y				0.0336	0.0336	pci/g
LT-G-029-4-6-20140224	160-5697-3	Protactinium 234	3/7/2014	1.21	Yes	Y	U		U	1.24	1.24	pci/g

Analytical Method E903.0												
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601078681A	1601078681A	RADIUM-226	2/28/2014	0.1267	Yes	Y	U		U	0.180	0.180	pci/l
FB029-20140224	160-5697-5	RADIUM-226	2/28/2014	0.136	Yes	Y	U		U	0.197	0.197	pci/l

Analytical Method E904.0												
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units

SDG: 16056971

Analytical Method E904.0

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601078671A	1601078671A	RADIUM-228	3/3/2014	0.02661	Yes	Y	U		U	0.286	0.286	pci/l
FB029-20140224	160-5697-5	RADIUM-228	3/3/2014	0.155	Yes	Y	U		U	0.383	0.383	pci/l
FB029-20140224LR	160-5697-5LR	RADIUM-228	3/3/2014	0.4336	Yes	Y				0.365	0.365	pci/l

Analytical Method		A-01-R										
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601080191A	1601080191A	THORIUM-230	3/5/2014	0.006558	Yes	Y	U		U	0.341	0.341	pci/l
1601080191A	1601080191A	THORIUM	3/5/2014	0.1606	Yes	Y	U		U	0.339	0.339	pci/l
1601080191A	1601080191A	THORIUM-228	3/5/2014	-0.04209	Yes	Y	U		U	0.574	0.574	pci/l
1601080211A	1601080211A	URANIUM 233 AND 234	3/5/2014	0.07756	Yes	Y	U		U	0.164	0.164	pci/l
1601080211A	1601080211A	URANIUM	3/5/2014	0.009675	Yes	Y	U		U	0.126	0.126	pci/l
1601080211A	1601080211A	URANIUM-235	3/5/2014	-0.00517	Yes	Y	U		U	0.126	0.126	pci/l
1601080241A	1601080241A	THORIUM	3/6/2014	0	Yes	Y	U		U	0.0298	0.0298	pci/g
1601080241A	1601080241A	THORIUM-228	3/6/2014	0.03541	Yes	Y	U		U	0.0860	0.0860	pci/g
1601080241A	1601080241A	THORIUM-230	3/6/2014	0.009356	Yes	Y	U		U	0.0455	0.0455	pci/g
1601091971A	1601091971A	URANIUM	3/12/2014	0.01816	Yes	Y	U		U	0.0456	0.0456	pci/g
1601091971A	1601091971A	URANIUM-235	3/12/2014	-0.002343	Yes	Y	U		U	0.0569	0.0569	pci/g
1601091971A	1601091971A	URANIUM 233 AND 234	3/12/2014	0.02636	Yes	Y	U		U	0.0522	0.0522	pci/g
CC-C-048-2-4-20140221	160-5703-1	THORIUM-230	3/6/2014	0.359	Yes	Y				0.0679	0.0679	pci/g
CC-C-048-2-4-20140221	160-5703-1	THORIUM-228	3/6/2014	0.383	Yes	Y				0.0637	0.0637	pci/g
CC-C-048-2-4-20140221	160-5703-1	THORIUM	3/6/2014	0.317	Yes	Y				0.0575	0.0575	pci/g
CC-C-048-2-4-20140221	160-5703-1	URANIUM-235	3/12/2014	0.0193	Yes	Y	U		U	0.0763	0.0763	pci/g
CC-C-048-2-4-20140221	160-5703-1	URANIUM 233 AND 234	3/12/2014	0.398	Yes	Y				0.0733	0.0733	pci/g
CC-C-048-2-4-20140221	160-5703-1	URANIUM	3/12/2014	0.371	Yes	Y				0.0795	0.0795	pci/g
CC-C-050-0-2-20140221	160-5703-2	THORIUM-230	3/6/2014	0.408	Yes	Y				0.0548	0.0548	pci/g
CC-C-050-0-2-20140221	160-5703-2	THORIUM-228	3/6/2014	0.269	Yes	Y				0.106	0.106	pci/g
CC-C-050-0-2-20140221	160-5703-2	THORIUM	3/6/2014	0.297	Yes	Y				0.0546	0.0546	pci/g
CC-C-050-0-2-20140221	160-5703-2	URANIUM 233 AND 234	3/12/2014	0.612	Yes	Y				0.0773	0.0773	pci/g
CC-C-050-0-2-20140221	160-5703-2	URANIUM	3/12/2014	0.558	Yes	Y				0.0594	0.0594	pci/g
CC-C-050-0-2-20140221	160-5703-2	URANIUM-235	3/12/2014	0.0342	Yes	Y	U		U	0.0676	0.0676	pci/g
FB028-20140221	160-5703-5	URANIUM-235	3/5/2014	0	Yes	Y	U		U	0.0777	0.0777	pci/l

Analytical Method A-01-R

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
FB028-20140221	160-5703-5	URANIUM 233 AND 234	3/5/2014	-0.0026	Yes	Y	U		U	0.142	0.142	pci/l
FB028-20140221	160-5703-5	URANIUM	3/5/2014	0.0143	Yes	Y	U		U	0.148	0.148	pci/l
FB028-20140221	160-5703-5	THORIUM-230	3/5/2014	0.237	Yes	Y				0.151	0.151	pci/l
FB028-20140221	160-5703-5	THORIUM	3/5/2014	-0.00873	Yes	Y	U		U	0.121	0.121	pci/l
FB028-20140221	160-5703-5	THORIUM-228	3/5/2014	0.057	Yes	Y	U		U	0.228	0.228	pci/l
LT-G-026-4-6-20140221	160-5703-3	THORIUM	3/6/2014	0.348	Yes	Y				0.0549	0.0549	pci/g
LT-G-026-4-6-20140221	160-5703-3	THORIUM-228	3/6/2014	0.481	Yes	Y				0.0858	0.0858	pci/g
LT-G-026-4-6-20140221	160-5703-3	THORIUM-230	3/6/2014	0.408	Yes	Y				0.0630	0.0630	pci/g
LT-G-026-4-6-20140221	160-5703-3	URANIUM	3/12/2014	0.258	Yes	Y				0.0719	0.0719	pci/g
LT-G-026-4-6-20140221	160-5703-3	URANIUM 233 AND 234	3/12/2014	0.193	Yes	Y				0.0773	0.0773	pci/g
LT-G-026-4-6-20140221	160-5703-3	URANIUM-235	3/12/2014	0.0384	Yes	Y	U		U	0.0896	0.0896	pci/g
LT-G-027-8-10-20140221	160-5703-4	THORIUM	3/6/2014	0.481	Yes	Y				0.0352	0.0352	pci/g
LT-G-027-8-10-20140221	160-5703-4	THORIUM-230	3/6/2014	0.257	Yes	Y				0.0536	0.0536	pci/g
LT-G-027-8-10-20140221	160-5703-4	THORIUM-228	3/6/2014	0.335	Yes	Y				0.0872	0.0872	pci/g
LT-G-027-8-10-20140221	160-5703-4	URANIUM-235	3/12/2014	0.022	Yes	Y	U		U	0.0704	0.0704	pci/g
LT-G-027-8-10-20140221	160-5703-4	URANIUM	3/12/2014	0.635	Yes	Y				0.0618	0.0618	pci/g
LT-G-027-8-10-20140221	160-5703-4	URANIUM 233 AND 234	3/12/2014	0.644	Yes	Y				0.0861	0.0861	pci/g

Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601078771A	1601078771A	PROTACTINIUM 231	2/28/2014	8.099	Yes	Y	U		U	110	110	pci/l
1601078771A	1601078771A	Protactinium 234	2/28/2014	45	Yes	Y	U		U	486	486	pci/l
1601078771A	1601078771A	AMERICIUM-241	2/28/2014	6.511	Yes	Y				5.57	5.57	pci/l
1601078771A	1601078771A	BISMUTH-212	2/28/2014	0	Yes	Y	U		U	43.0	43.0	pci/l
1601078771A	1601078771A	BISMUTH-214	2/28/2014	2.846	Yes	Y	U		U	10.3	10.3	pci/l

Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601078771A	1601078771A	CESIUM-137	2/28/2014	1.815	Yes	Y	U		U	3.47	3.47	pci/l
1601078771A	1601078771A	COBALT-60	2/28/2014	-0.1425	Yes	Y	U		U	3.89	3.89	pci/l
1601078771A	1601078771A	LEAD-212	2/28/2014	-1.979	Yes	Y	U		U	7.23	7.23	pci/l
1601078771A	1601078771A	POTASSIUM-40	2/28/2014	-51.2	Yes	Y	U		U	61.2	61.2	pci/l
1601078771A	1601078771A	LEAD-214	2/28/2014	-1.771	Yes	Y	U		U	9.05	9.05	pci/l
1601078771A	1601078771A	ACTINIUM 228	2/28/2014	9.046	Yes	Y	U		U	11.2	11.2	pci/l
1601079551A	1601079551A	PROTACTINIUM 231	3/4/2014	0.01801	Yes	Y	U		U	0.100	0.100	pci/g
1601079551A	1601079551A	Protactinium 234	3/4/2014	-0.13	Yes	Y	U		U	0.764	0.764	pci/g
1601079551A	1601079551A	RADIUM-226	3/4/2014	-0.00556	Yes	Y	U		U	0.0812	0.0812	pci/g
1601079551A	1601079551A	RADIUM-228	3/4/2014	0.009706	Yes	Y	U		U	0.0166	0.0166	pci/g
1601079551A	1601079551A	THALLIUM-208	3/4/2014	0.003029	Yes	Y	U		U	0.00480	0.00480	pci/g
1601079551A	1601079551A	POTASSIUM-40	3/4/2014	0	Yes	Y	U		U	0.0805	0.0805	pci/g
1601079551A	1601079551A	URANIUM	3/4/2014	0.03113	Yes	Y	U		U	0.0779	0.0779	pci/g
1601079551A	1601079551A	BISMUTH-214	3/4/2014	0.003687	Yes	Y	U		U	0.0113	0.0113	pci/g
1601079551A	1601079551A	URANIUM-235	3/4/2014	0.01139	Yes	Y	U		U	0.0177	0.0177	pci/g
1601079551A	1601079551A	THORIUM-234	3/4/2014	0.03113	Yes	Y	U		U	0.0779	0.0779	pci/g
1601079551A	1601079551A	LEAD-214	3/4/2014	0.005871	Yes	Y	U		U	0.00780	0.00780	pci/g
1601079551A	1601079551A	LEAD-212	3/4/2014	0.002962	Yes	Y	U		U	0.00703	0.00703	pci/g
1601079551A	1601079551A	LEAD-210	3/4/2014	0.03886	Yes	Y	U		U	0.0865	0.0865	pci/g
1601079551A	1601079551A	CESIUM-137	3/4/2014	0.000407	Yes	Y	U		U	0.00381	0.00381	pci/g
1601079551A	1601079551A	BISMUTH-212	3/4/2014	0.01583	Yes	Y	U		U	0.0505	0.0505	pci/g
1601079551A	1601079551A	AMERICIUM-241	3/4/2014	0.001496	Yes	Y	U		U	0.00603	0.00603	pci/g
1601079551A	1601079551A	ACTINIUM 228	3/4/2014	0.009706	Yes	Y	U		U	0.0166	0.0166	pci/g
1601079551A	1601079551A	COBALT-60	3/4/2014	0.0001524	Yes	Y	U		U	0.00380	0.00380	pci/g
CC-C-048-2-4-20140221	160-5703-1	LEAD-212	3/5/2014	0.498	Yes	Y				0.00955	0.00955	pci/g

Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
CC-C-048-2-4-20140221	160-5703-1	URANIUM-235	3/5/2014	0.0306	Yes	Y	U		U	0.0347	0.0347	pci/g
CC-C-048-2-4-20140221	160-5703-1	ACTINIUM 228	3/5/2014	0.459	Yes	Y				0.0181	0.0181	pci/g
CC-C-048-2-4-20140221	160-5703-1	LEAD-210	3/5/2014	0.407	Yes	Y				0.128	0.128	pci/g
CC-C-048-2-4-20140221	160-5703-1	BISMUTH-214	3/5/2014	0.326	Yes	Y				0.0110	0.0110	pci/g
CC-C-048-2-4-20140221	160-5703-1	BISMUTH-212	3/5/2014	0.546	Yes	Y				0.0749	0.0749	pci/g
CC-C-048-2-4-20140221	160-5703-1	URANIUM	3/5/2014	0.475	Yes	Y				0.144	0.144	pci/g
CC-C-048-2-4-20140221	160-5703-1	LEAD-214	3/5/2014	0.375	Yes	Y				0.0130	0.0130	pci/g
CC-C-048-2-4-20140221	160-5703-1	PROTACTINIUM 231	3/5/2014	-0.202	Yes	Y	U		U	0.183	0.183	pci/g
CC-C-048-2-4-20140221	160-5703-1	Protactinium 234	3/5/2014	0.24	Yes	Y	U		U	0.696	0.696	pci/g
CC-C-048-2-4-20140221	160-5703-1	RADIUM-226	3/5/2014	0.805	Yes	Y				0.143	0.143	pci/g
CC-C-048-2-4-20140221	160-5703-1	RADIUM-228	3/5/2014	0.459	Yes	Y				0.0181	0.0181	pci/g
CC-C-048-2-4-20140221	160-5703-1	THALLIUM-208	3/5/2014	0.151	Yes	Y				0.00705	0.00705	pci/g
CC-C-048-2-4-20140221	160-5703-1	THORIUM-234	3/5/2014	0.475	Yes	Y				0.144	0.144	pci/g
CC-C-048-2-4-20140221	160-5703-1	POTASSIUM-40	3/5/2014	6.09	Yes	Y				0.0735	0.0735	pci/g
CC-C-050-0-2-20140221	160-5703-2	RADIUM-228	3/6/2014	0.705	Yes	Y				0.0273	0.0273	pci/g
CC-C-050-0-2-20140221	160-5703-2	URANIUM	3/6/2014	0.634	Yes	Y				0.172	0.172	pci/g
CC-C-050-0-2-20140221	160-5703-2	THORIUM-234	3/6/2014	0.634	Yes	Y				0.172	0.172	pci/g
CC-C-050-0-2-20140221	160-5703-2	THALLIUM-208	3/6/2014	0.246	Yes	Y				0.00834	0.00834	pci/g
CC-C-050-0-2-20140221	160-5703-2	Protactinium 234	3/6/2014	0.814	Yes	Y	U		U	1.23	1.23	pci/g
CC-C-050-0-2-20140221	160-5703-2	PROTACTINIUM 231	3/6/2014	-0.356	Yes	Y	U		U	0.236	0.236	pci/g
CC-C-050-0-2-20140221	160-5703-2	POTASSIUM-40	3/6/2014	11.5	Yes	Y				0.0821	0.0821	pci/g
CC-C-050-0-2-20140221	160-5703-2	LEAD-214	3/6/2014	0.608	Yes	Y				0.0154	0.0154	pci/g
CC-C-050-0-2-20140221	160-5703-2	ACTINIUM 228	3/6/2014	0.705	Yes	Y				0.0273	0.0273	pci/g
CC-C-050-0-2-20140221	160-5703-2	BISMUTH-212	3/6/2014	0.809	Yes	Y				0.0865	0.0865	pci/g
CC-C-050-0-2-20140221	160-5703-2	LEAD-212	3/6/2014	0.774	Yes	Y				0.0118	0.0118	pci/g

Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
CC-C-050-0-2-20140221	160-5703-2	LEAD-210	3/6/2014	0.564	Yes	Y				0.156	0.156	pci/g
CC-C-050-0-2-20140221	160-5703-2	BISMUTH-214	3/6/2014	0.546	Yes	Y				0.0165	0.0165	pci/g
CC-C-050-0-2-20140221	160-5703-2	RADIUM-226	3/6/2014	1.39	Yes	Y				0.154	0.154	pci/g
CC-C-050-0-2-20140221	160-5703-2	URANIUM-235	3/6/2014	0.0331	Yes	Y	U		U	0.0358	0.0358	pci/g
FB028-20140221	160-5703-5	BISMUTH-212	3/7/2014	8.75	Yes	Y	U		U	44.1	44.1	pci/l
FB028-20140221	160-5703-5	POTASSIUM-40	3/7/2014	17.4	Yes	Y	U		U	69.7	69.7	pci/l
FB028-20140221	160-5703-5	LEAD-214	3/7/2014	8.23	Yes	Y	U		U	10.3	10.3	pci/l
FB028-20140221	160-5703-5	LEAD-212	3/7/2014	7.57	Yes	Y	U		U	9.35	9.35	pci/l
FB028-20140221	160-5703-5	BISMUTH-214	3/7/2014	7.01	Yes	Y	U		U	11.4	11.4	pci/l
FB028-20140221	160-5703-5	ACTINIUM 228	3/7/2014	22.1	Yes	Y				9.62	9.62	pci/l
FB028-20140221	160-5703-5	Protactinium 234	3/7/2014	664	Yes	Y				391	391	pci/l
FB028-20140221	160-5703-5	PROTACTINIUM 231	3/7/2014	24.2	Yes	Y	U		U	99.7	99.7	pci/l
FB028-20140221	160-5703-5	CESIUM-137	3/7/2014	0.00167	Yes	Y	U		U	3.61	3.61	pci/l
LT-G-026-4-6-20140221	160-5703-3	POTASSIUM-40	3/7/2014	6.74	Yes	Y				0.0784	0.0784	pci/g
LT-G-026-4-6-20140221	160-5703-3	URANIUM	3/7/2014	0.453	Yes	Y				0.147	0.147	pci/g
LT-G-026-4-6-20140221	160-5703-3	ACTINIUM 228	3/7/2014	0.483	Yes	Y				0.0193	0.0193	pci/g
LT-G-026-4-6-20140221	160-5703-3	BISMUTH-212	3/7/2014	0.521	Yes	Y				0.0675	0.0675	pci/g
LT-G-026-4-6-20140221	160-5703-3	BISMUTH-214	3/7/2014	0.382	Yes	Y				0.0126	0.0126	pci/g
LT-G-026-4-6-20140221	160-5703-3	LEAD-210	3/7/2014	0.427	Yes	Y				0.141	0.141	pci/g
LT-G-026-4-6-20140221	160-5703-3	LEAD-212	3/7/2014	0.5	Yes	Y				0.0103	0.0103	pci/g
LT-G-026-4-6-20140221	160-5703-3	LEAD-214	3/7/2014	0.415	Yes	Y				0.0136	0.0136	pci/g
LT-G-026-4-6-20140221	160-5703-3	PROTACTINIUM 231	3/7/2014	-0.124	Yes	Y	U		U	0.189	0.189	pci/g
LT-G-026-4-6-20140221	160-5703-3	Protactinium 234	3/7/2014	0.611	Yes	Y	U		U	0.846	0.846	pci/g
LT-G-026-4-6-20140221	160-5703-3	RADIUM-226	3/7/2014	0.821	Yes	Y				0.132	0.132	pci/g
LT-G-026-4-6-20140221	160-5703-3	RADIUM-228	3/7/2014	0.483	Yes	Y				0.0193	0.0193	pci/g

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Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-G-026-4-6-20140221	160-5703-3	THORIUM-234	3/7/2014	0.453	Yes	Y				0.147	0.147	pci/g
LT-G-026-4-6-20140221	160-5703-3	THALLIUM-208	3/7/2014	0.151	Yes	Y				0.00672	0.00672	pci/g
LT-G-026-4-6-20140221	160-5703-3	URANIUM-235	3/7/2014	0.0327	Yes	Y				0.0292	0.0292	pci/g
LT-G-027-8-10-20140221	160-5703-4	LEAD-212	3/10/2014	0.625	Yes	Y				0.0163	0.0163	pci/g
LT-G-027-8-10-20140221	160-5703-4	LEAD-210	3/10/2014	0.559	Yes	Y				0.197	0.197	pci/g
LT-G-027-8-10-20140221	160-5703-4	POTASSIUM-40	3/10/2014	10.4	Yes	Y				0.0942	0.0942	pci/g
LT-G-027-8-10-20140221	160-5703-4	THORIUM-234	3/10/2014	0.816	Yes	Y				0.200	0.200	pci/g
LT-G-027-8-10-20140221	160-5703-4	RADIUM-228	3/10/2014	0.623	Yes	Y				0.0248	0.0248	pci/g
LT-G-027-8-10-20140221	160-5703-4	RADIUM-226	3/10/2014	1.79	Yes	Y				0.198	0.198	pci/g
LT-G-027-8-10-20140221	160-5703-4	PROTACTINIUM 231	3/10/2014	-0.173	Yes	Y	U		U	0.252	0.252	pci/g
LT-G-027-8-10-20140221	160-5703-4	LEAD-214	3/10/2014	0.661	Yes	Y				0.0180	0.0180	pci/g
LT-G-027-8-10-20140221	160-5703-4	BISMUTH-212	3/10/2014	0.795	Yes	Y				0.0967	0.0967	pci/g
LT-G-027-8-10-20140221	160-5703-4	THALLIUM-208	3/10/2014	0.212	Yes	Y				0.00887	0.00887	pci/g
LT-G-027-8-10-20140221	160-5703-4	ACTINIUM 228	3/10/2014	0.623	Yes	Y				0.0248	0.0248	pci/g
LT-G-027-8-10-20140221	160-5703-4	Protactinium 234	3/10/2014	1.47	Yes	Y		U	U	0.977	0.977	pci/g
LT-G-027-8-10-20140221	160-5703-4	URANIUM-235	3/10/2014	0.0611	Yes	Y				0.0369	0.0369	pci/g
LT-G-027-8-10-20140221	160-5703-4	URANIUM	3/10/2014	0.816	Yes	Y				0.200	0.200	pci/g
LT-G-027-8-10-20140221	160-5703-4	BISMUTH-214	3/10/2014	0.601	Yes	Y				0.0168	0.0168	pci/g

Analytical Method E903.0

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601078681A	1601078681A	RADIUM-226	2/28/2014	0.1267	Yes	Y	U		U	0.180	0.180	pci/l
FB028-20140221	160-5703-5	RADIUM-226	2/28/2014	0.117	Yes	Y	U		U	0.246	0.246	pci/l
FB028-20140221LR	160-5703-5LR	RADIUM-226	2/28/2014	0.1058	Yes	Y	U		U	0.196	0.196	pci/l

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Analytical Method		E904.0										
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601078671A	1601078671A	RADIUM-228	3/3/2014	0.02661	Yes	Y	U		U	0.286	0.286	pci/l
FB028-20140221	160-5703-5	RADIUM-228	3/3/2014	0.19	Yes	Y	U		U	0.432	0.432	pci/l

Analytical Method A-01-R

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601086921A	1601086921A	URANIUM	3/10/2014	-0.008264	Yes	Y	U		U	0.0673	0.0673	pci/g
1601086921A	1601086921A	URANIUM-235	3/10/2014	-0.005152	Yes	Y	U		U	0.0714	0.0714	pci/g
1601086921A	1601086921A	URANIUM 233 AND 234	3/10/2014	-0.01242	Yes	Y	U		U	0.0751	0.0751	pci/g
1601087951A	1601087951A	THORIUM	3/12/2014	0.036	Yes	Y	U		U	0.202	0.202	pci/l
1601087951A	1601087951A	THORIUM-230	3/12/2014	0.1614	Yes	Y	U		U	0.231	0.231	pci/l
1601087951A	1601087951A	THORIUM-228	3/12/2014	0.1314	Yes	Y	U		U	0.362	0.362	pci/l
1601088071A	1601088071A	URANIUM-235	3/12/2014	0.06864	Yes	Y	U		U	0.136	0.136	pci/l
1601088071A	1601088071A	URANIUM	3/12/2014	0.001311	Yes	Y	U		U	0.136	0.136	pci/l
1601088071A	1601088071A	URANIUM 233 AND 234	3/12/2014	0.02758	Yes	Y	U		U	0.161	0.161	pci/l
1601105191A	1601105191A	THORIUM-230	3/18/2014	0.1411	Yes	Y				0.0573	0.0573	pci/l
1601105191A	1601105191A	THORIUM-228	3/18/2014	-0.0008633	Yes	Y	U		U	0.139	0.139	pci/l
1601105191A	1601105191A	THORIUM	3/18/2014	0.02621	Yes	Y	U		U	0.0309	0.0309	pci/l
1601105221A	1601105221A	THORIUM-230	3/19/2014	0.06205	Yes	Y				0.0312	0.0312	pci/g
1601105221A	1601105221A	THORIUM-228	3/19/2014	0.03117	Yes	Y	U		U	0.0957	0.0957	pci/g
1601105221A	1601105221A	THORIUM	3/19/2014	0.006464	Yes	Y	U		U	0.0537	0.0537	pci/g
CC-C-028-GW-20140226	160-5766-6	URANIUM	3/12/2014	0.0286	Yes	Y	U		U	0.0857	0.0857	pci/l
CC-C-028-GW-20140226	160-5766-6	URANIUM-235	3/12/2014	-0.0134	Yes	Y	U		U	0.185	0.185	pci/l
CC-C-028-GW-20140226	160-5766-6	URANIUM 233 AND 234	3/12/2014	0.156	Yes	Y	U		U	0.163	0.163	pci/l
CC-C-028-GW-20140226	160-5766-6	THORIUM-228	3/12/2014	0.25	Yes	Y	U		U	0.479	0.479	pci/l
CC-C-028-GW-20140226	160-5766-6	THORIUM-230	3/12/2014	0.0414	Yes	Y	U		U	0.304	0.304	pci/l
CC-C-028-GW-20140226	160-5766-6	THORIUM	3/12/2014	-0.0226	Yes	Y	U		U	0.314	0.314	pci/l
DUP032-20140226	160-5766-8	URANIUM	3/12/2014	0.307	Yes	Y				0.192	0.192	pci/l
DUP032-20140226	160-5766-8	URANIUM 233 AND 234	3/12/2014	0.205	Yes	Y				0.173	0.173	pci/l
DUP032-20140226	160-5766-8	URANIUM-235	3/12/2014	-0.0066	Yes	Y	U		U	0.160	0.160	pci/l
DUP032-20140226	160-5766-8	THORIUM	3/12/2014	-0.0288	Yes	Y	U		U	0.292	0.292	pci/l

Analytical Method		A-01-R										
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
DUP032-20140226	160-5766-8	THORIUM-228	3/12/2014	0.277	Yes	Y	U		U	0.454	0.454	pci/l
DUP032-20140226	160-5766-8	THORIUM-230	3/12/2014	0.242	Yes	Y	U		U	0.268	0.268	pci/l
FB004-GW-20140226	160-5766-9	URANIUM 233 AND 234	3/12/2014	0.0302	Yes	Y	U		U	0.147	0.147	pci/l
FB004-GW-20140226	160-5766-9	URANIUM-235	3/12/2014	0.0301	Yes	Y	U		U	0.0902	0.0902	pci/l
FB004-GW-20140226	160-5766-9	URANIUM	3/12/2014	-0.00452	Yes	Y	U		U	0.110	0.110	pci/l
FB004-GW-20140226	160-5766-9	THORIUM-228	3/12/2014	0.0182	Yes	Y	U		U	0.376	0.376	pci/l
FB004-GW-20140226	160-5766-9	THORIUM-230	3/12/2014	0.142	Yes	Y	U		U	0.233	0.233	pci/l
FB004-GW-20140226	160-5766-9	THORIUM	3/12/2014	-0.0508	Yes	Y	U		U	0.304	0.304	pci/l
FB031-20140226	160-5766-5	URANIUM-235	3/12/2014	0.023	Yes	Y	U		U	0.129	0.129	pci/l
FB031-20140226	160-5766-5	URANIUM	3/12/2014	0.0184	Yes	Y	U		U	0.103	0.103	pci/l
FB031-20140226	160-5766-5	URANIUM 233 AND 234	3/12/2014	0.0512	Yes	Y	U		U	0.139	0.139	pci/l
FB031-20140226	160-5766-5	THORIUM-228	3/12/2014	0.239	Yes	Y	U		U	0.329	0.329	pci/l
FB031-20140226	160-5766-5	THORIUM	3/12/2014	0.0373	Yes	Y	U		U	0.112	0.112	pci/l
FB031-20140226	160-5766-5	THORIUM-230	3/12/2014	0.104	Yes	Y	U		U	0.171	0.171	pci/l
LT-C-054-GW-20140226	160-5766-7	URANIUM-235	3/12/2014	-0.17	Yes	Y	U		U	2.36	2.36	pci/l
LT-C-054-GW-20140226	160-5766-7	URANIUM 233 AND 234	3/12/2014	7.03	Yes	Y				2.23	2.23	pci/l
LT-C-054-GW-20140226	160-5766-7	URANIUM	3/12/2014	4.39	Yes	Y				2.36	2.36	pci/l
LT-C-054-GW-20140226	160-5766-7	THORIUM-228	3/19/2014	3.58	Yes	Y				1.34	1.34	pci/l
LT-C-054-GW-20140226	160-5766-7	THORIUM-230	3/19/2014	4.18	Yes	Y				0.891	0.891	pci/l
LT-C-054-GW-20140226	160-5766-7	THORIUM	3/19/2014	2.62	Yes	Y				1.10	1.10	pci/l
LT-C-064-8-10-20140226	160-5766-4	URANIUM-235	3/9/2014	0.0283	Yes	Y	U		U	0.0424	0.0424	pci/g
LT-C-064-8-10-20140226	160-5766-4	URANIUM 233 AND 234	3/9/2014	0.317	Yes	Y				0.0925	0.0925	pci/g
LT-C-064-8-10-20140226	160-5766-4	URANIUM	3/9/2014	0.275	Yes	Y				0.0692	0.0692	pci/g
LT-C-064-8-10-20140226	160-5766-4	THORIUM-230	3/19/2014	0.385	Yes	Y		U	U	0.0488	0.0488	pci/g
LT-C-064-8-10-20140226	160-5766-4	THORIUM	3/19/2014	0.395	Yes	Y				0.0320	0.0320	pci/g

Analytical Method A-01-R

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-C-064-8-10-20140226	160-5766-4	THORIUM-228	3/19/2014	0.486	Yes	Y				0.0821	0.0821	pci/g
LT-C-065-0-2-20140226	160-5766-1	URANIUM	3/9/2014	0.293	Yes	Y				0.0608	0.0608	pci/g
LT-C-065-0-2-20140226	160-5766-1	URANIUM 233 AND 234	3/9/2014	0.374	Yes	Y				0.0872	0.0872	pci/g
LT-C-065-0-2-20140226	160-5766-1	URANIUM-235	3/9/2014	0.0241	Yes	Y	U		U	0.0606	0.0606	pci/g
LT-C-065-0-2-20140226	160-5766-1	THORIUM	3/19/2014	0.556	Yes	Y				0.0334	0.0334	pci/g
LT-C-065-0-2-20140226	160-5766-1	THORIUM-228	3/19/2014	0.464	Yes	Y				0.0961	0.0961	pci/g
LT-C-065-0-2-20140226	160-5766-1	THORIUM-230	3/19/2014	0.51	Yes	Y		U	U	0.0581	0.0581	pci/g
LT-C-065-0-2-20140226LR	160-5766-1LR	URANIUM	3/9/2014	0.2791	Yes	Y				0.0969	0.0969	pci/g
LT-C-065-0-2-20140226LR	160-5766-1LR	URANIUM-235	3/9/2014	0.01457	Yes	Y	U		U	0.0888	0.0888	pci/g
LT-C-065-0-2-20140226LR	160-5766-1LR	URANIUM 233 AND 234	3/9/2014	0.2976	Yes	Y				0.130	0.130	pci/g
LT-C-065-0-2-20140226LR	160-5766-1LR	THORIUM	3/19/2014	0.3827	Yes	Y				0.0306	0.0306	pci/g
LT-C-065-0-2-20140226LR	160-5766-1LR	THORIUM-230	3/19/2014	0.47	Yes	Y				0.0470	0.0470	pci/g
LT-C-065-0-2-20140226LR	160-5766-1LR	THORIUM-228	3/19/2014	0.4457	Yes	Y				0.100	0.100	pci/g
LT-C-066-0-2-20140226	160-5766-2	URANIUM-235	3/9/2014	0.0346	Yes	Y	U		U	0.0685	0.0685	pci/g
LT-C-066-0-2-20140226	160-5766-2	URANIUM	3/9/2014	0.447	Yes	Y				0.0645	0.0645	pci/g
LT-C-066-0-2-20140226	160-5766-2	URANIUM 233 AND 234	3/9/2014	0.385	Yes	Y				0.0811	0.0811	pci/g
LT-C-066-0-2-20140226	160-5766-2	THORIUM-230	3/19/2014	0.66	Yes	Y		U	U	0.0529	0.0529	pci/g
LT-C-066-0-2-20140226	160-5766-2	THORIUM-228	3/19/2014	0.484	Yes	Y				0.121	0.121	pci/g
LT-C-066-0-2-20140226	160-5766-2	THORIUM	3/19/2014	0.678	Yes	Y				0.0601	0.0601	pci/g
LT-C-067-10-12-20140226	160-5766-3	URANIUM 233 AND 234	3/9/2014	0.19	Yes	Y				0.0840	0.0840	pci/g
LT-C-067-10-12-20140226	160-5766-3	URANIUM-235	3/9/2014	0.0333	Yes	Y	U		U	0.0777	0.0777	pci/g
LT-C-067-10-12-20140226	160-5766-3	URANIUM	3/9/2014	0.105	Yes	Y				0.0569	0.0569	pci/g
LT-C-067-10-12-20140226	160-5766-3	THORIUM	3/19/2014	0.411	Yes	Y				0.0590	0.0590	pci/g
LT-C-067-10-12-20140226	160-5766-3	THORIUM-228	3/19/2014	0.499	Yes	Y				0.0955	0.0955	pci/g
LT-C-067-10-12-20140226	160-5766-3	THORIUM-230	3/19/2014	0.29	Yes	Y		U	U	0.0650	0.0650	pci/g

Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601083491A	1601083491A	LEAD-214	3/17/2014	6.516	Yes	Y	U		U	8.72	8.72	pci/l
1601083491A	1601083491A	Protactinium 234	3/17/2014	36.22	Yes	Y	U		U	517	517	pci/l
1601083491A	1601083491A	COBALT-60	3/17/2014	1.393	Yes	Y	U		U	4.79	4.79	pci/l
1601083491A	1601083491A	AMERICIUM-241	3/17/2014	1.671	Yes	Y	U		U	6.04	6.04	pci/l
1601083491A	1601083491A	POTASSIUM-40	3/17/2014	43.13	Yes	Y	U		U	61.8	61.8	pci/l
1601083491A	1601083491A	CESIUM-137	3/17/2014	-1.12	Yes	Y	U		U	4.78	4.78	pci/l
1601083491A	1601083491A	BISMUTH-214	3/17/2014	3.807	Yes	Y	U		U	11.8	11.8	pci/l
1601083491A	1601083491A	BISMUTH-212	3/17/2014	19.67	Yes	Y	U		U	47.2	47.2	pci/l
1601083491A	1601083491A	PROTACTINIUM 231	3/17/2014	3.76	Yes	Y	U		U	107	107	pci/l
1601083491A	1601083491A	LEAD-212	3/17/2014	-1.999	Yes	Y	U		U	7.56	7.56	pci/l
1601083491A	1601083491A	ACTINIUM 228	3/17/2014	7.374	Yes	Y	U		U	14.7	14.7	pci/l
1601087801A	1601087801A	AMERICIUM-241	3/14/2014	-0.0004537	Yes	Y	U		U	0.00786	0.00786	pci/g
1601087801A	1601087801A	BISMUTH-212	3/14/2014	0.02268	Yes	Y	U		U	0.0509	0.0509	pci/g
1601087801A	1601087801A	BISMUTH-214	3/14/2014	-0.007453	Yes	Y	U		U	0.0129	0.0129	pci/g
1601087801A	1601087801A	URANIUM-235	3/14/2014	0.01029	Yes	Y	U		U	0.0224	0.0224	pci/g
1601087801A	1601087801A	THALLIUM-208	3/14/2014	0.001967	Yes	Y	U		U	0.00518	0.00518	pci/g
1601087801A	1601087801A	COBALT-60	3/14/2014	-0.00005143	Yes	Y	U		U	0.00566	0.00566	pci/g
1601087801A	1601087801A	CESIUM-137	3/14/2014	-0.00128	Yes	Y	U		U	0.00521	0.00521	pci/g
1601087801A	1601087801A	URANIUM	3/14/2014	0.00292	Yes	Y	U		U	0.0862	0.0862	pci/g
1601087801A	1601087801A	THORIUM-234	3/14/2014	0.00292	Yes	Y	U		U	0.0862	0.0862	pci/g
1601087801A	1601087801A	Protactinium 234	3/14/2014	0.2832	Yes	Y	U		U	0.571	0.571	pci/g
1601087801A	1601087801A	LEAD-210	3/14/2014	0.02257	Yes	Y	U		U	0.0924	0.0924	pci/g
1601087801A	1601087801A	ACTINIUM 228	3/14/2014	0.005747	Yes	Y	U		U	0.0171	0.0171	pci/g
1601087801A	1601087801A	LEAD-214	3/14/2014	0.001548	Yes	Y	U		U	0.0103	0.0103	pci/g
1601087801A	1601087801A	RADIUM-228	3/14/2014	0.005747	Yes	Y	U		U	0.0171	0.0171	pci/g

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1601087801A	1601087801A	POTASSIUM-40	3/14/2014	0.03049	Yes	Y	U		U	0.0590	0.0590	pci/g
1601087801A	1601087801A	PROTACTINIUM 231	3/14/2014	0.01539	Yes	Y	U		U	0.0784	0.0784	pci/g
1601087801A	1601087801A	RADIUM-226	3/14/2014	-0.05294	Yes	Y	U		U	0.107	0.107	pci/g
1601087801A	1601087801A	LEAD-212	3/14/2014	0.001223	Yes	Y	U		U	0.00827	0.00827	pci/g
CC-C-028-GW-20140226	160-5766-6	LEAD-212	3/10/2014	1.55	Yes	Y	U		U	7.40	7.40	pci/l
CC-C-028-GW-20140226	160-5766-6	BISMUTH-212	3/10/2014	17.8	Yes	Y	U		U	44.9	44.9	pci/l
CC-C-028-GW-20140226	160-5766-6	CESIUM-137	3/10/2014	0.565	Yes	Y	U		U	4.03	4.03	pci/l
CC-C-028-GW-20140226	160-5766-6	LEAD-214	3/10/2014	1.07	Yes	Y	U		U	10.5	10.5	pci/l
CC-C-028-GW-20140226	160-5766-6	POTASSIUM-40	3/10/2014	100	Yes	Y				74.4	74.4	pci/l
CC-C-028-GW-20140226	160-5766-6	PROTACTINIUM 231	3/10/2014	4.82	Yes	Y	U		U	107	107	pci/l
CC-C-028-GW-20140226	160-5766-6	Protactinium 234	3/10/2014	192	Yes	Y	U		U	504	504	pci/l
CC-C-028-GW-20140226	160-5766-6	ACTINIUM 228	3/10/2014	25.9	Yes	Y				11.2	11.2	pci/l
CC-C-028-GW-20140226	160-5766-6	BISMUTH-214	3/10/2014	2.92	Yes	Y	U		U	11.7	11.7	pci/l
DUP032-20140226	160-5766-8	ACTINIUM 228	3/10/2014	11	Yes	Y	U		U	13.8	13.8	pci/l
DUP032-20140226	160-5766-8	Protactinium 234	3/10/2014	160	Yes	Y	U		U	531	531	pci/l
DUP032-20140226	160-5766-8	PROTACTINIUM 231	3/10/2014	22.7	Yes	Y	U		U	112	112	pci/l
DUP032-20140226	160-5766-8	POTASSIUM-40	3/10/2014	76.5	Yes	Y				64.8	64.8	pci/l
DUP032-20140226	160-5766-8	LEAD-214	3/10/2014	8.57	Yes	Y	U		U	9.08	9.08	pci/l
DUP032-20140226	160-5766-8	LEAD-212	3/10/2014	-1.29	Yes	Y	U		U	7.53	7.53	pci/l
DUP032-20140226	160-5766-8	CESIUM-137	3/10/2014	1.69	Yes	Y	U		U	3.23	3.23	pci/l
DUP032-20140226	160-5766-8	BISMUTH-212	3/10/2014	22.6	Yes	Y	U		U	47.9	47.9	pci/l
DUP032-20140226	160-5766-8	BISMUTH-214	3/10/2014	7.74	Yes	Y	U		U	12.7	12.7	pci/l
FB004-GW-20140226	160-5766-9	BISMUTH-212	3/14/2014	17.9	Yes	Y	U		U	44.6	44.6	pci/l
FB004-GW-20140226	160-5766-9	Protactinium 234	3/14/2014	137	Yes	Y	U		U	512	512	pci/l
FB004-GW-20140226	160-5766-9	PROTACTINIUM 231	3/14/2014	-8.94	Yes	Y	U		U	102	102	pci/l

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FB004-GW-20140226	160-5766-9	POTASSIUM-40	3/14/2014	57.5	Yes	Y				43.7	43.7	pci/l
FB004-GW-20140226	160-5766-9	LEAD-214	3/14/2014	11	Yes	Y				7.23	7.23	pci/l
FB004-GW-20140226	160-5766-9	LEAD-212	3/14/2014	0.978	Yes	Y	U		U	7.67	7.67	pci/l
FB004-GW-20140226	160-5766-9	ACTINIUM 228	3/14/2014	5.02	Yes	Y	U		U	11.6	11.6	pci/l
FB004-GW-20140226	160-5766-9	BISMUTH-214	3/14/2014	5.45	Yes	Y	U		U	8.59	8.59	pci/l
FB004-GW-20140226	160-5766-9	CESIUM-137	3/14/2014	1.74	Yes	Y	U		U	3.48	3.48	pci/l
FB031-20140226	160-5766-5	LEAD-212	3/12/2014	-1.94	Yes	Y	U		U	7.19	7.19	pci/l
FB031-20140226	160-5766-5	POTASSIUM-40	3/12/2014	48.9	Yes	Y	U		U	62.0	62.0	pci/l
FB031-20140226	160-5766-5	Protactinium 234	3/12/2014	193	Yes	Y	U		U	516	516	pci/l
FB031-20140226	160-5766-5	CESIUM-137	3/12/2014	-0.0162	Yes	Y	U		U	4.20	4.20	pci/l
FB031-20140226	160-5766-5	BISMUTH-214	3/12/2014	-3.29	Yes	Y	U		U	11.7	11.7	pci/l
FB031-20140226	160-5766-5	BISMUTH-212	3/12/2014	24.8	Yes	Y	U		U	45.6	45.6	pci/l
FB031-20140226	160-5766-5	LEAD-214	3/12/2014	-1.86	Yes	Y	U		U	9.76	9.76	pci/l
FB031-20140226	160-5766-5	ACTINIUM 228	3/12/2014	8.87	Yes	Y	U		U	14.4	14.4	pci/l
FB031-20140226	160-5766-5	PROTACTINIUM 231	3/12/2014	5.43	Yes	Y	U		U	107	107	pci/l
FB031-20140226LR	160-5766-5LR	AMERICIUM-241	3/11/2014	1.601	Yes	Y	U		U	8.12	8.12	pci/l
FB031-20140226LR	160-5766-5LR	Protactinium 234	3/11/2014	293.1	Yes	Y	U		U	474	474	pci/l
FB031-20140226LR	160-5766-5LR	PROTACTINIUM 231	3/11/2014	-3.854	Yes	Y	U		U	104	104	pci/l
FB031-20140226LR	160-5766-5LR	POTASSIUM-40	3/11/2014	19.08	Yes	Y	U		U	55.7	55.7	pci/l
FB031-20140226LR	160-5766-5LR	LEAD-214	3/11/2014	5.064	Yes	Y	U		U	9.61	9.61	pci/l
FB031-20140226LR	160-5766-5LR	LEAD-212	3/11/2014	0.9164	Yes	Y	U		U	7.11	7.11	pci/l
FB031-20140226LR	160-5766-5LR	COBALT-60	3/11/2014	1.392	Yes	Y	U		U	3.70	3.70	pci/l
FB031-20140226LR	160-5766-5LR	CESIUM-137	3/11/2014	1.028	Yes	Y	U		U	3.83	3.83	pci/l
FB031-20140226LR	160-5766-5LR	BISMUTH-212	3/11/2014	16.17	Yes	Y	U		U	48.1	48.1	pci/l
FB031-20140226LR	160-5766-5LR	ACTINIUM 228	3/11/2014	7.336	Yes	Y	U		U	12.5	12.5	pci/l

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FB031-20140226LR	160-5766-5LR	BISMUTH-214	3/11/2014	10.01	Yes	Y	U		U	10.6	10.6	pci/l
LT-C-054-GW-20140226	160-5766-7	ACTINIUM 228	3/17/2014	20.8	Yes	Y				9.81	9.81	pci/l
LT-C-054-GW-20140226	160-5766-7	LEAD-212	3/17/2014	4.59	Yes	Y	U		U	7.33	7.33	pci/l
LT-C-054-GW-20140226	160-5766-7	LEAD-214	3/17/2014	25	Yes	Y				6.92	6.92	pci/l
LT-C-054-GW-20140226	160-5766-7	BISMUTH-214	3/17/2014	16.8	Yes	Y				9.43	9.43	pci/l
LT-C-054-GW-20140226	160-5766-7	CESIUM-137	3/17/2014	0.283	Yes	Y	U		U	4.25	4.25	pci/l
LT-C-054-GW-20140226	160-5766-7	POTASSIUM-40	3/17/2014	110	Yes	Y				46.3	46.3	pci/l
LT-C-054-GW-20140226	160-5766-7	PROTACTINIUM 231	3/17/2014	7.72	Yes	Y	U		U	109	109	pci/l
LT-C-054-GW-20140226	160-5766-7	Protactinium 234	3/17/2014	479	Yes	Y				460	460	pci/l
LT-C-054-GW-20140226	160-5766-7	BISMUTH-212	3/17/2014	12.7	Yes	Y	U		U	47.1	47.1	pci/l
LT-C-064-8-10-20140226	160-5766-4	LEAD-210	3/11/2014	0.374	Yes	Y				0.138	0.138	pci/g
LT-C-064-8-10-20140226	160-5766-4	THALLIUM-208	3/11/2014	0.163	Yes	Y				0.00743	0.00743	pci/g
LT-C-064-8-10-20140226	160-5766-4	ACTINIUM 228	3/11/2014	0.539	Yes	Y				0.0202	0.0202	pci/g
LT-C-064-8-10-20140226	160-5766-4	LEAD-214	3/11/2014	0.42	Yes	Y				0.0143	0.0143	pci/g
LT-C-064-8-10-20140226	160-5766-4	URANIUM-235	3/11/2014	0.0554	Yes	Y				0.0381	0.0381	pci/g
LT-C-064-8-10-20140226	160-5766-4	THORIUM-234	3/11/2014	0.499	Yes	Y				0.158	0.158	pci/g
LT-C-064-8-10-20140226	160-5766-4	RADIUM-228	3/11/2014	0.539	Yes	Y				0.0202	0.0202	pci/g
LT-C-064-8-10-20140226	160-5766-4	RADIUM-226	3/11/2014	0.847	Yes	Y				0.155	0.155	pci/g
LT-C-064-8-10-20140226	160-5766-4	Protactinium 234	3/11/2014	0.579	Yes	Y	U		U	1.00	1.00	pci/g
LT-C-064-8-10-20140226	160-5766-4	PROTACTINIUM 231	3/11/2014	-0.206	Yes	Y	U		U	0.213	0.213	pci/g
LT-C-064-8-10-20140226	160-5766-4	POTASSIUM-40	3/11/2014	6.13	Yes	Y				0.0741	0.0741	pci/g
LT-C-064-8-10-20140226	160-5766-4	LEAD-212	3/11/2014	0.54	Yes	Y				0.0110	0.0110	pci/g
LT-C-064-8-10-20140226	160-5766-4	BISMUTH-214	3/11/2014	0.37	Yes	Y				0.0144	0.0144	pci/g
LT-C-064-8-10-20140226	160-5766-4	BISMUTH-212	3/11/2014	0.595	Yes	Y				0.0866	0.0866	pci/g
LT-C-064-8-10-20140226	160-5766-4	URANIUM	3/11/2014	0.499	Yes	Y				0.158	0.158	pci/g

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LT-C-065-0-2-20140226	160-5766-1	ACTINIUM 228	3/14/2014	0.559	Yes	Y				0.0286	0.0286	pci/g
LT-C-065-0-2-20140226	160-5766-1	Protactinium 234	3/14/2014	1.67	Yes	Y				0.889	0.889	pci/g
LT-C-065-0-2-20140226	160-5766-1	URANIUM	3/14/2014	0.604	Yes	Y				0.162	0.162	pci/g
LT-C-065-0-2-20140226	160-5766-1	THORIUM-234	3/14/2014	0.604	Yes	Y				0.162	0.162	pci/g
LT-C-065-0-2-20140226	160-5766-1	THALLIUM-208	3/14/2014	0.184	Yes	Y				0.00759	0.00759	pci/g
LT-C-065-0-2-20140226	160-5766-1	RADIUM-228	3/14/2014	0.559	Yes	Y				0.0286	0.0286	pci/g
LT-C-065-0-2-20140226	160-5766-1	RADIUM-226	3/14/2014	1.11	Yes	Y				0.177	0.177	pci/g
LT-C-065-0-2-20140226	160-5766-1	PROTACTINIUM 231	3/14/2014	-0.226	Yes	Y	U		U	0.226	0.226	pci/g
LT-C-065-0-2-20140226	160-5766-1	LEAD-214	3/14/2014	0.546	Yes	Y				0.0157	0.0157	pci/g
LT-C-065-0-2-20140226	160-5766-1	LEAD-210	3/14/2014	0.436	Yes	Y				0.156	0.156	pci/g
LT-C-065-0-2-20140226	160-5766-1	URANIUM-235	3/14/2014	0.0554	Yes	Y				0.0356	0.0356	pci/g
LT-C-065-0-2-20140226	160-5766-1	BISMUTH-212	3/14/2014	0.623	Yes	Y				0.0987	0.0987	pci/g
LT-C-065-0-2-20140226	160-5766-1	POTASSIUM-40	3/14/2014	8.88	Yes	Y				0.0837	0.0837	pci/g
LT-C-065-0-2-20140226	160-5766-1	BISMUTH-214	3/14/2014	0.446	Yes	Y				0.0162	0.0162	pci/g
LT-C-065-0-2-20140226	160-5766-1	LEAD-212	3/14/2014	0.608	Yes	Y				0.0116	0.0116	pci/g
LT-C-065-0-2-20140226LR	160-5766-1LR	LEAD-210	3/14/2014	0.4963	Yes	Y				0.154	0.154	pci/g
LT-C-065-0-2-20140226LR	160-5766-1LR	Protactinium 234	3/14/2014	1.248	Yes	Y				0.694	0.694	pci/g
LT-C-065-0-2-20140226LR	160-5766-1LR	PROTACTINIUM 231	3/14/2014	-0.2934	Yes	Y	U		U	0.205	0.205	pci/g
LT-C-065-0-2-20140226LR	160-5766-1LR	THALLIUM-208	3/14/2014	0.1943	Yes	Y				0.00756	0.00756	pci/g
LT-C-065-0-2-20140226LR	160-5766-1LR	THORIUM-234	3/14/2014	0.6658	Yes	Y				0.169	0.169	pci/g
LT-C-065-0-2-20140226LR	160-5766-1LR	URANIUM	3/14/2014	0.6658	Yes	Y				0.169	0.169	pci/g
LT-C-065-0-2-20140226LR	160-5766-1LR	URANIUM-235	3/14/2014	0.06007	Yes	Y				0.0410	0.0410	pci/g
LT-C-065-0-2-20140226LR	160-5766-1LR	POTASSIUM-40	3/14/2014	9.096	Yes	Y				0.0629	0.0629	pci/g
LT-C-065-0-2-20140226LR	160-5766-1LR	RADIUM-226	3/14/2014	1.073	Yes	Y				0.163	0.163	pci/g
LT-C-065-0-2-20140226LR	160-5766-1LR	LEAD-212	3/14/2014	0.6064	Yes	Y				0.0110	0.0110	pci/g

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LT-C-065-0-2-20140226LR	160-5766-1LR	RADIUM-228	3/14/2014	0.5671	Yes	Y				0.0215	0.0215	pci/g
LT-C-065-0-2-20140226LR	160-5766-1LR	COBALT-60	3/14/2014	-0.001459	Yes	Y	U		U	0.00936	0.00936	pci/g
LT-C-065-0-2-20140226LR	160-5766-1LR	CESIUM-137	3/14/2014	0.05582	Yes	Y				0.00685	0.00685	pci/g
LT-C-065-0-2-20140226LR	160-5766-1LR	BISMUTH-214	3/14/2014	0.4752	Yes	Y				0.0152	0.0152	pci/g
LT-C-065-0-2-20140226LR	160-5766-1LR	BISMUTH-212	3/14/2014	0.6546	Yes	Y				0.0881	0.0881	pci/g
LT-C-065-0-2-20140226LR	160-5766-1LR	AMERICIUM-241	3/14/2014	0.008756	Yes	Y	U		U	0.0143	0.0143	pci/g
LT-C-065-0-2-20140226LR	160-5766-1LR	ACTINIUM 228	3/14/2014	0.5671	Yes	Y				0.0215	0.0215	pci/g
LT-C-065-0-2-20140226LR	160-5766-1LR	LEAD-214	3/14/2014	0.5412	Yes	Y				0.0131	0.0131	pci/g
LT-C-066-0-2-20140226	160-5766-2	Protactinium 234	3/11/2014	1.65	Yes	Y				0.976	0.976	pci/g
LT-C-066-0-2-20140226	160-5766-2	ACTINIUM 228	3/11/2014	0.766	Yes	Y				0.0278	0.0278	pci/g
LT-C-066-0-2-20140226	160-5766-2	PROTACTINIUM 231	3/11/2014	0.0985	Yes	Y	U		U	0.189	0.189	pci/g
LT-C-066-0-2-20140226	160-5766-2	POTASSIUM-40	3/11/2014	8.92	Yes	Y				0.0926	0.0926	pci/g
LT-C-066-0-2-20140226	160-5766-2	LEAD-214	3/11/2014	0.66	Yes	Y				0.0205	0.0205	pci/g
LT-C-066-0-2-20140226	160-5766-2	LEAD-212	3/11/2014	0.839	Yes	Y				0.0136	0.0136	pci/g
LT-C-066-0-2-20140226	160-5766-2	LEAD-210	3/11/2014	0.865	Yes	Y				0.200	0.200	pci/g
LT-C-066-0-2-20140226	160-5766-2	URANIUM-235	3/11/2014	0.0539	Yes	Y				0.0467	0.0467	pci/g
LT-C-066-0-2-20140226	160-5766-2	BISMUTH-212	3/11/2014	0.809	Yes	Y				0.0827	0.0827	pci/g
LT-C-066-0-2-20140226	160-5766-2	RADIUM-226	3/11/2014	1.46	Yes	Y				0.194	0.194	pci/g
LT-C-066-0-2-20140226	160-5766-2	RADIUM-228	3/11/2014	0.766	Yes	Y				0.0278	0.0278	pci/g
LT-C-066-0-2-20140226	160-5766-2	THALLIUM-208	3/11/2014	0.262	Yes	Y				0.00926	0.00926	pci/g
LT-C-066-0-2-20140226	160-5766-2	THORIUM-234	3/11/2014	0.765	Yes	Y				0.190	0.190	pci/g
LT-C-066-0-2-20140226	160-5766-2	URANIUM	3/11/2014	0.765	Yes	Y				0.190	0.190	pci/g
LT-C-066-0-2-20140226	160-5766-2	BISMUTH-214	3/11/2014	0.586	Yes	Y				0.0178	0.0178	pci/g
LT-C-067-10-12-20140226	160-5766-3	Protactinium 234	3/11/2014	0.592	Yes	Y	U		U	0.730	0.730	pci/g
LT-C-067-10-12-20140226	160-5766-3	URANIUM	3/11/2014	0.307	Yes	Y				0.141	0.141	pci/g

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LT-C-067-10-12-20140226	160-5766-3	POTASSIUM-40	3/11/2014	5.42	Yes	Y				0.0664	0.0664	pci/g
LT-C-067-10-12-20140226	160-5766-3	PROTACTINIUM 231	3/11/2014	-0.176	Yes	Y	U		U	0.186	0.186	pci/g
LT-C-067-10-12-20140226	160-5766-3	ACTINIUM 228	3/11/2014	0.47	Yes	Y				0.0191	0.0191	pci/g
LT-C-067-10-12-20140226	160-5766-3	BISMUTH-212	3/11/2014	0.533	Yes	Y				0.0703	0.0703	pci/g
LT-C-067-10-12-20140226	160-5766-3	BISMUTH-214	3/11/2014	0.222	Yes	Y				0.0125	0.0125	pci/g
LT-C-067-10-12-20140226	160-5766-3	LEAD-210	3/11/2014	0.169	Yes	Y				0.139	0.139	pci/g
LT-C-067-10-12-20140226	160-5766-3	LEAD-212	3/11/2014	0.453	Yes	Y				0.0123	0.0123	pci/g
LT-C-067-10-12-20140226	160-5766-3	THALLIUM-208	3/11/2014	0.158	Yes	Y				0.00628	0.00628	pci/g
LT-C-067-10-12-20140226	160-5766-3	LEAD-214	3/11/2014	0.247	Yes	Y				0.0137	0.0137	pci/g
LT-C-067-10-12-20140226	160-5766-3	RADIUM-226	3/11/2014	0.516	Yes	Y				0.126	0.126	pci/g
LT-C-067-10-12-20140226	160-5766-3	THORIUM-234	3/11/2014	0.307	Yes	Y				0.141	0.141	pci/g
LT-C-067-10-12-20140226	160-5766-3	RADIUM-228	3/11/2014	0.47	Yes	Y				0.0191	0.0191	pci/g
LT-C-067-10-12-20140226	160-5766-3	URANIUM-235	3/11/2014	0.0188	Yes	Y	U		U	0.0400	0.0400	pci/g

Analytical Method E903.0												
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601080711A	1601080711A	RADIUM-226	3/5/2014	0.09473	Yes	Y	U		U	0.183	0.183	pci/l
CC-C-028-GW-20140226	160-5766-6	RADIUM-226	3/5/2014	1.76	Yes	Y				0.242	0.242	pci/l
DUP032-20140226	160-5766-8	RADIUM-226	3/5/2014	1.11	Yes	Y				0.233	0.233	pci/l
FB004-GW-20140226	160-5766-9	RADIUM-226	3/5/2014	0.0199	Yes	Y	U		U	0.231	0.231	pci/l
FB004-GW-20140226LR	160-5766-9LR	RADIUM-226	3/5/2014	0.1228	Yes	Y	U		U	0.191	0.191	pci/l
FB031-20140226	160-5766-5	RADIUM-226	3/5/2014	0.0555	Yes	Y	U		U	0.201	0.201	pci/l
LT-C-054-GW-20140226	160-5766-7	RADIUM-226	3/5/2014	11.6	Yes	Y				0.725	0.725	pci/l

Analytical Method E904.0												
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units

SDG: 16057661

Analytical Method E904.0

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601080671A	1601080671A	RADIUM-228	3/6/2014	0.05515	Yes	Y	U		U	0.365	0.365	pci/l
CC-C-028-GW-20140226	160-5766-6	RADIUM-228	3/6/2014	1.24	Yes	Y				0.433	0.433	pci/l
DUP032-20140226	160-5766-8	RADIUM-228	3/6/2014	1.09	Yes	Y				0.420	0.420	pci/l
FB004-GW-20140226	160-5766-9	RADIUM-228	3/6/2014	0.209	Yes	Y	U		U	0.346	0.346	pci/l
FB031-20140226	160-5766-5	RADIUM-228	3/6/2014	0.0677	Yes	Y	U		U	0.349	0.349	pci/l
LT-C-054-GW-20140226	160-5766-7	RADIUM-228	3/6/2014	2.9	Yes	Y				1.85	1.85	pci/l

SDG: 16057662

Analytical Method E903.0

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601127391A	1601127391A	RADIUM-226	3/30/2014	0.05449	Yes	Y	U		U	0.0633	0.0633	pci/l
LT-C-054-GW-20140226	160-5766-7	RADIUM-226	3/30/2014	4.75	Yes	Y				0.312	0.312	pci/l